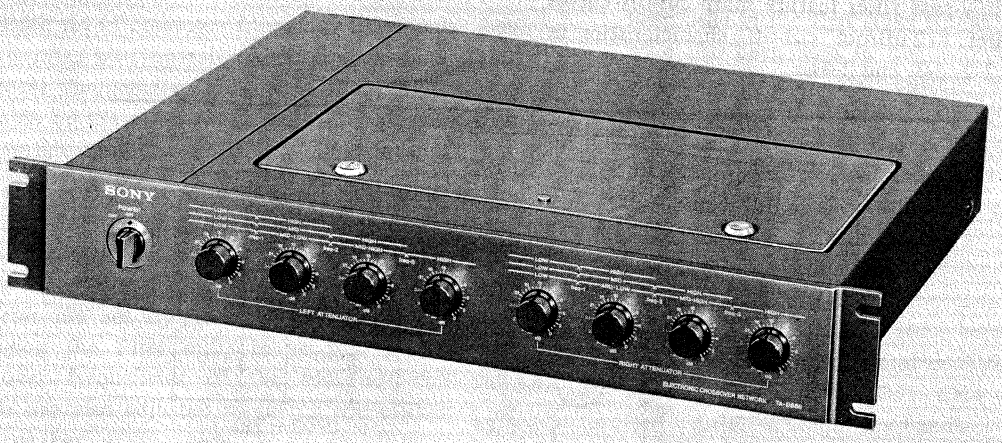
TA-D88B

Canadian Model
AEP Model



ELECTRONIC CROSSOVER NETWORK

SPECIFICATIONS

General

Power Requirements: 120 V ac~, 60 Hz (Canadian Model)
110 V, 120 V, 220 V, or
240 V ac~, 50/60 Hz (AEP model)

Power Consumption: 20 watts

Dimensions: Approx.
480 (w) x 80 (h) x 365 (d) mm
18 $^{15}/_{16}$ (w) x 3 $^{1}/_{8}$ (h) x 14 $^{3}/_{8}$ (d) inches
Including projection parts and controls.

Weight: Approx. 7.4kg, 16 lb 5 oz, net
Approx. 9.5kg, 20 lb 15 oz, in shipping carton

System: Filter characteristics: 24 dB-per-octave Bessel function high-pass and low-pass
Buffer amp: DC amp

Crossover Frequency: UNIT 1: 140 Hz, 225 Hz, 280 Hz
UNIT 2: 500 Hz, 800 Hz, 1 kHz
UNIT 3: 1.25 kHz, 2 kHz, 2.5 kHz
UNIT 4: 5 kHz, 8 kHz, 10 kHz

Bandpass Gain: 0 dB

Inputs: 1 volt rated/7 volts maximum, 50 k ohms

Outputs: 1 volt rated/7 volts maximum, 100 ohms

Harmonic Distortion: Less than 0.003 % at 1 volt output
Less than 0.005 % at 5 volts output

Signal-to-Noise Ratio: Better than 110 dB (1 volt rated input, short-circuited input, weighting network A)

Frequency Response: DC—100 kHz $^{+0}_{-1}$ dB

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ !

LES COMPOSANTS IDENTIFIÉS PAR UN TRAMÉ ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY-RELATED COMPONENT WARNING !!

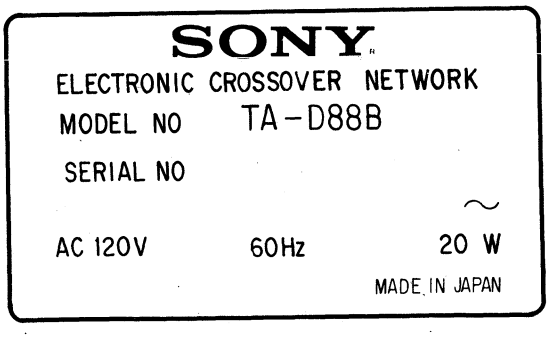
COMPONENTS IDENTIFIED BY SHADING AND ⚠ MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SONY®

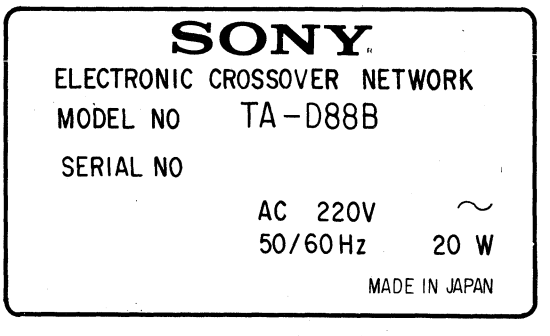
SERVICE MANUAL

- **MODEL IDENTIFICATION**
  – Specification Label –

Canadian model



AEP model



SECTION 1
OUTLINE

1-1. CIRCUIT DESCRIPTION

The TA-D88B is an electronic crossover network designed for use in multi-amplifier stereo systems. The input audio signal is divided into a number of different frequency bands, each band being amplified independently and passed on to individual speakers. See fig. 3 for an outline of the circuit diagram.

Each set of crossover frequency filters have been incorporated into separate plug-in type units. Suitable crossover frequencies for a wide range of speakers available on the market may be set by plugging in an appropriate combination of the 4 different units.

The crossover frequency of each unit is determined by the capacitance of the filters, and the frequency selector switches S1–S4. For 2-way to 4-way multi-amplifier systems, the crossover frequencies are set by adjusting S1–S4, and by rearranging the filter units in accordance with the crossover frequencies of the speakers employed. Levels are also adjusted to match the efficiency of each speaker.

Note that the following description refers to a 4-way multi-amplifier system.

1. Pre-buffer Amplifier Stage (see Fig. 1)

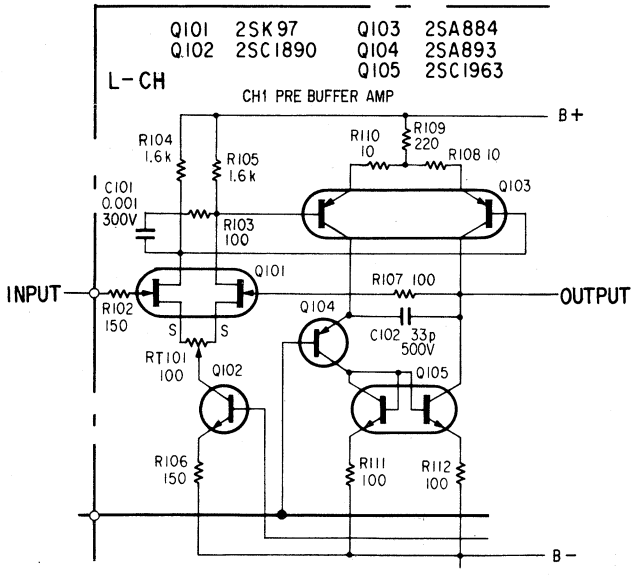


Fig. 1

The purpose of the pre-buffer amplifier (Q101–Q105) is to eliminate the influence of the preamplifier and connecting cord upon the filters. With 100% negative feedback applied to the first-stage differential amplifier (Q101) by resistor R107 (100 Ω), the pre-buffer amplifier has high input impedance and low output impedance. In addition, a current-mirror loaded 2-stage differential amplifier structure reduces distortion to a very low level. Furthermore, in order to make the low channel amplifier a pure DC amplifier employing no coupling capacitors, a dual FET differntial amplifier which suppresses DC drift has been used in the first stage (Q101). Dual transistors have also been used in the second stage differential amplifier (Q103) and current mirror (Q105) to further suppress DC drift. By connecting the base of Q104 to ground, the collector voltage of the PNP transistor on the left hand side of Q103 is reduced to almost 0 V, thereby equalizing the collector voltage of both PNP transistors in Q103. The dual transistor Pc (power input dc to collector) are therefore very much the same, resulting in the amount of drift in both sides being balanced. The impedance-converted signal is then passed from the pre-buffer amplifier to CH1–CH4 where it is divided into 4 different frequency bands.

2. LOW Channel Stage (CH-1)

The low-pass filters employed in this stage achieve a very sharp cut-off slope of 24 dB/oct (12 dB/oct at filter 1-1 and again at filter 1-2). (See Fig. 3-1).

Each low-pass filter buffer amplifier has a high input impedance and low output impedance current-mirror loaded 2-stage differential amplifier, similar to the pre-buffer amplifier (Q101–Q105). The crossover frequency is selected by the freq-1 switch (S1), thereby defining the f_1 frequency band.

The filter output signal is then passed via the level adjustment control (RV601) on to the output buffer amplifier (Q106–Q110) where the impedance is again converted, and finally appearing on the J102 output terminal. The role of this output buffer amplifier is not to change the crossover-frequency and the input impedance of the power amplifier.

3. MID-LOW Channel Stage (CH-2)

The signal whose impedance was converted in the pre-buffer amplifier is narrowed down to a frequency band between f_1 and f_2 according to the freq-1 and freq-2 settings (see Fig. 3-2). Both the high-pass filter and low-pass filter feature sharp cut-off curves of 24 dB/oct (12 dB/oct cut-off characteristics in filters 2-1, 2-2, 2-3, and 2-4).

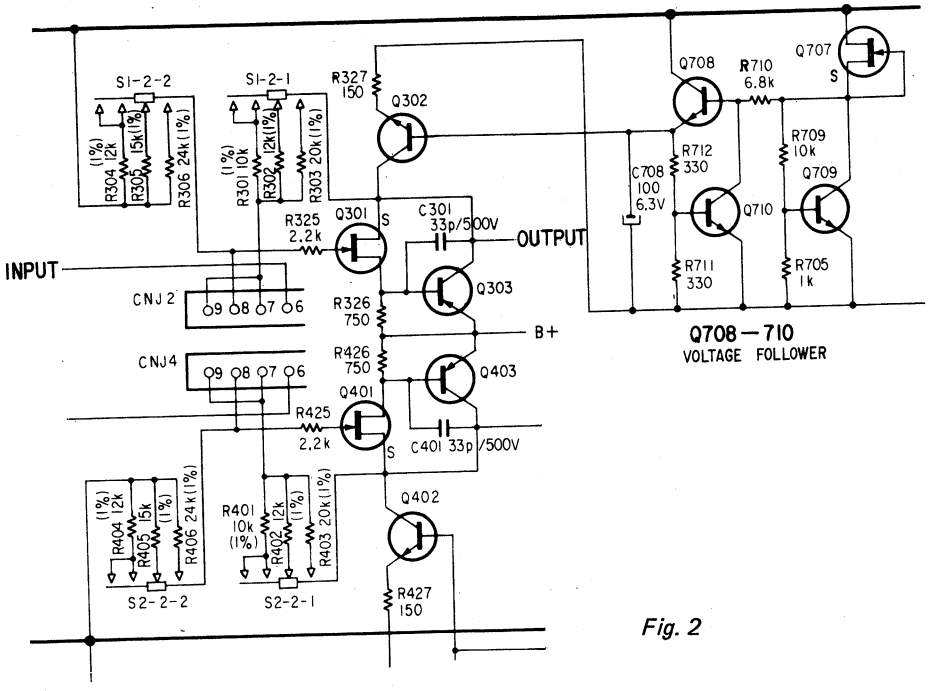


Fig. 2

The basic circuitry employed in the buffer amplifiers in each of the filters in the MID-LOW channel stage is outlined in Fig. 2. Each of these buffer amplifiers are bybrid type source-follower amplifiers employing PNP transistors and FETs designed for high frequency circuits. By connecting the collector of Q303 to the source of the high frequency FET, a 100% negative feedback is applied for high input impedance and low output impedance. The load for this amplifier is Q302. And since it is a constant current load, there is very little distortion, and no interference from the filter unit power supplies. The bias applied to the base of Q302 is stabilized by Q707–Q710.

Since there is no need to operate the MID-LOW channel stage anywhere near the DC region, coupling capacitors have been employed prior to the RV602 control and the output terminals, thereby suppressing DC offset. The capacitor employed in front of RV602 consists of a tantalum capacitor (C305) connected in parallel with a film capacitor (C306), and has been inserted in order to prevent deterioration of sound quality.

The MID-LOW channel stage employs an output buffer amplifier (Q111–Q113) in the output stage for the same reason as the LOW channel stage.

4. MID-HIGH Channel Stage (CH-3)

The MID-HIGH channel stage employs the same basic circuit structure as the MID-LOW channel stage. The frequency band between the f_2 and f_3 crossover frequencies is set by the freq-2 and freq-3 switch positions (see Fig. 3-3).

5. HIGH Channel Stage (CH-4)

The circuitry of this stage is basically the same as the high-pass filter and output buffer amplifier employed in the MID-HIGH channel stage. The frequency band is determined by the f_3 crossover frequency set by the freq-3 switch position (see Fig. 3-4).

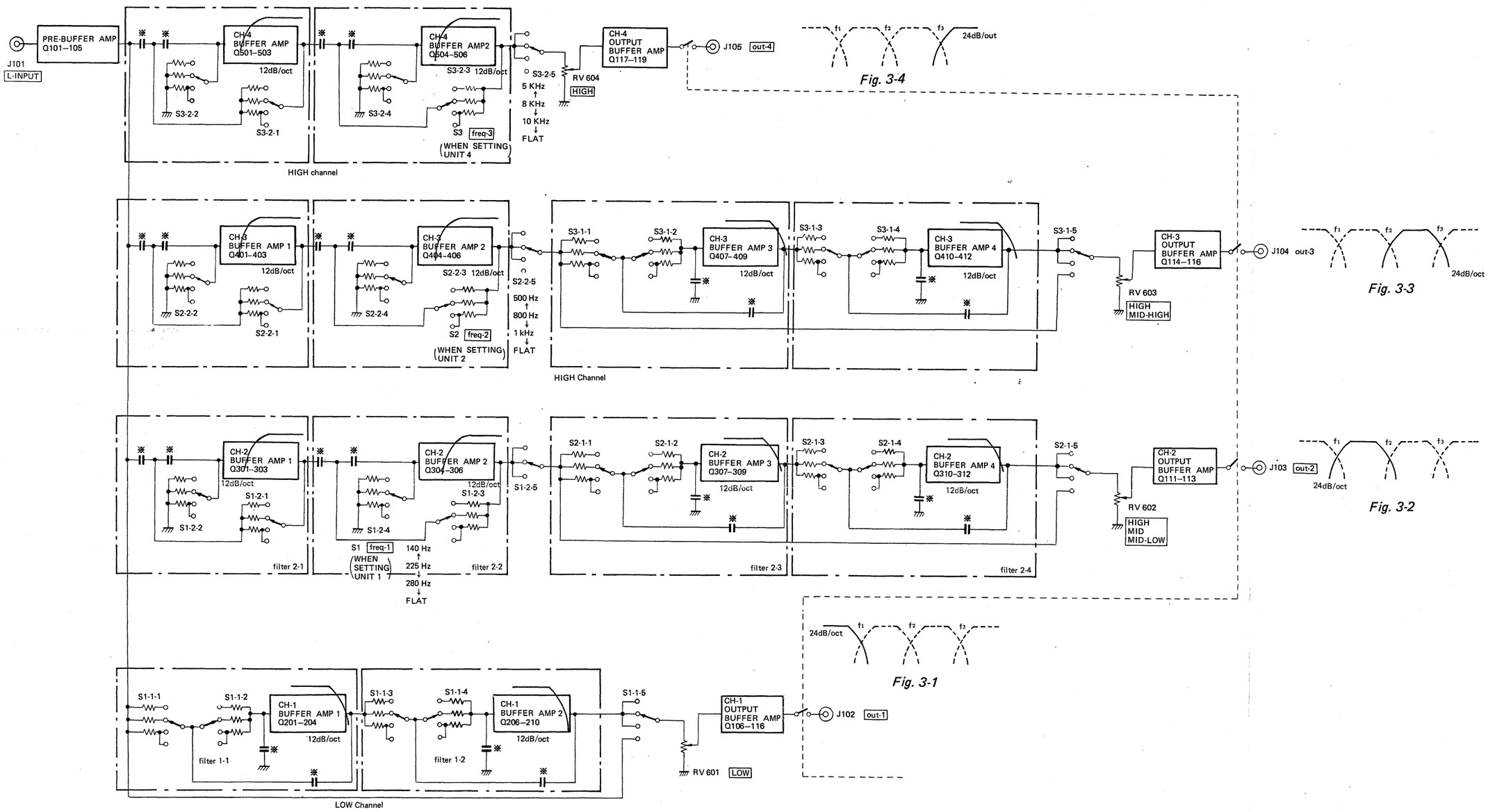


Fig. 3

The capacitance values marked ※ are decided by setting the units 1 to 4.

6. Muting Circuit (Fig. 4)

By activating a relay circuit, the muting circuit disconnects the signal line, and thereby prevents the appearance of any signals at the output terminals when the power switch is turned on and off. The "pop" noises generated at this time are therefore completely silenced. Note that this muting circuit is designed to close the signal line when the muting relays (RY1–RY8) are "on".

In addition, whenever the frequency response select cover is opened to exchange filter units, S7 is switched off, and again preventing the apperance of any signals at the output terminals.

1) When the power switch is turned on

(a) As soon as the power switch is turned on, both B+ and B– will commence to "charge up". C810 will also commence to charge up, requiring 2 to 3 seconds (as determined by the R803/C810 time constant) to be fully charged. During this period Q801 and Q802 will remain off, thereby keeping the muting relays (RV1–RV8) off as well. Therefore, no signals will appear at the output terminals, effectively muting out the power switching noise.

(b) 2 to 3 seconds after turning the power switch on, the potential on the base of Q801 reaches "on" potential, resulting in this transistor turning on.

(c) As soon as Q801 is turned on, Q802 is also turned on, resulting in muting relays (RY1–RY8) being turned on, and the output signals appear at the output terminals.

2) When the power switch is turned off

(a) At the same time that the power switch is turned off, the positive potential which had been applied to the cathode of D803 via D802 decreases, resulting in the D803 diode being turned on by the forward biasing.

(b) The charge on C810 is consequently discharged via D803 and R802, resulting in Q801 and Q802 both being turned off. The muting relays are also turned off, preventing any output signals from appearing at the output terminals. The "pop" noise generated when the power switch is turned off is also effectively muted.

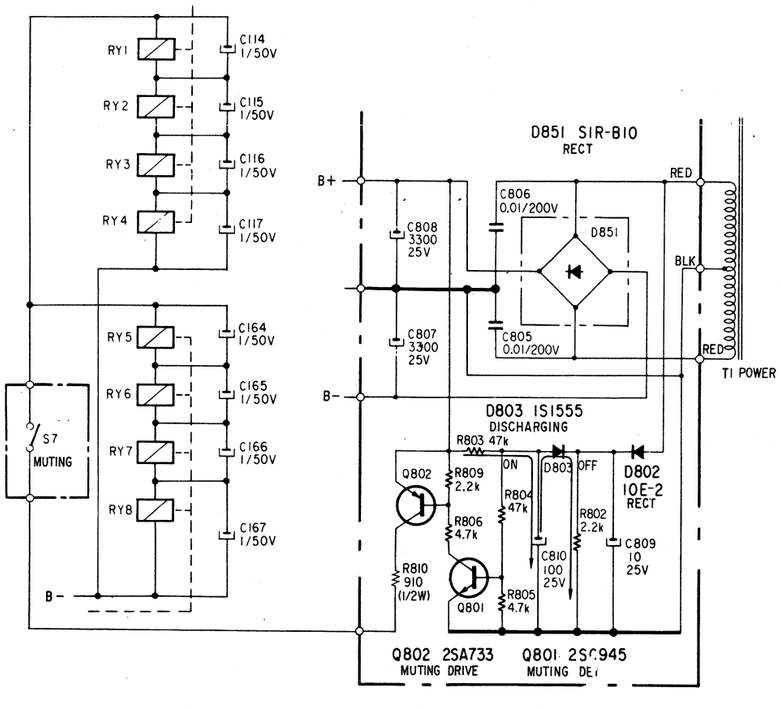


Fig. 4

3) When the frequency response select cover is opened (Fig. 5).

When the frequency response select cover is opened, S7 is turned off, thereby cutting off the voltage being applied to the muting relays (RY1–RY8). These relays are therefore turned off, and no signals will appear at the output terminals. So none of the noise generated when exchanging units will reach the speakers.

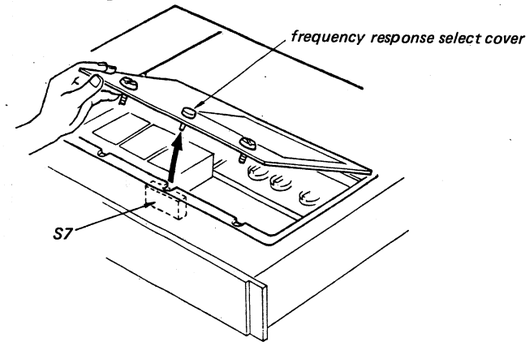
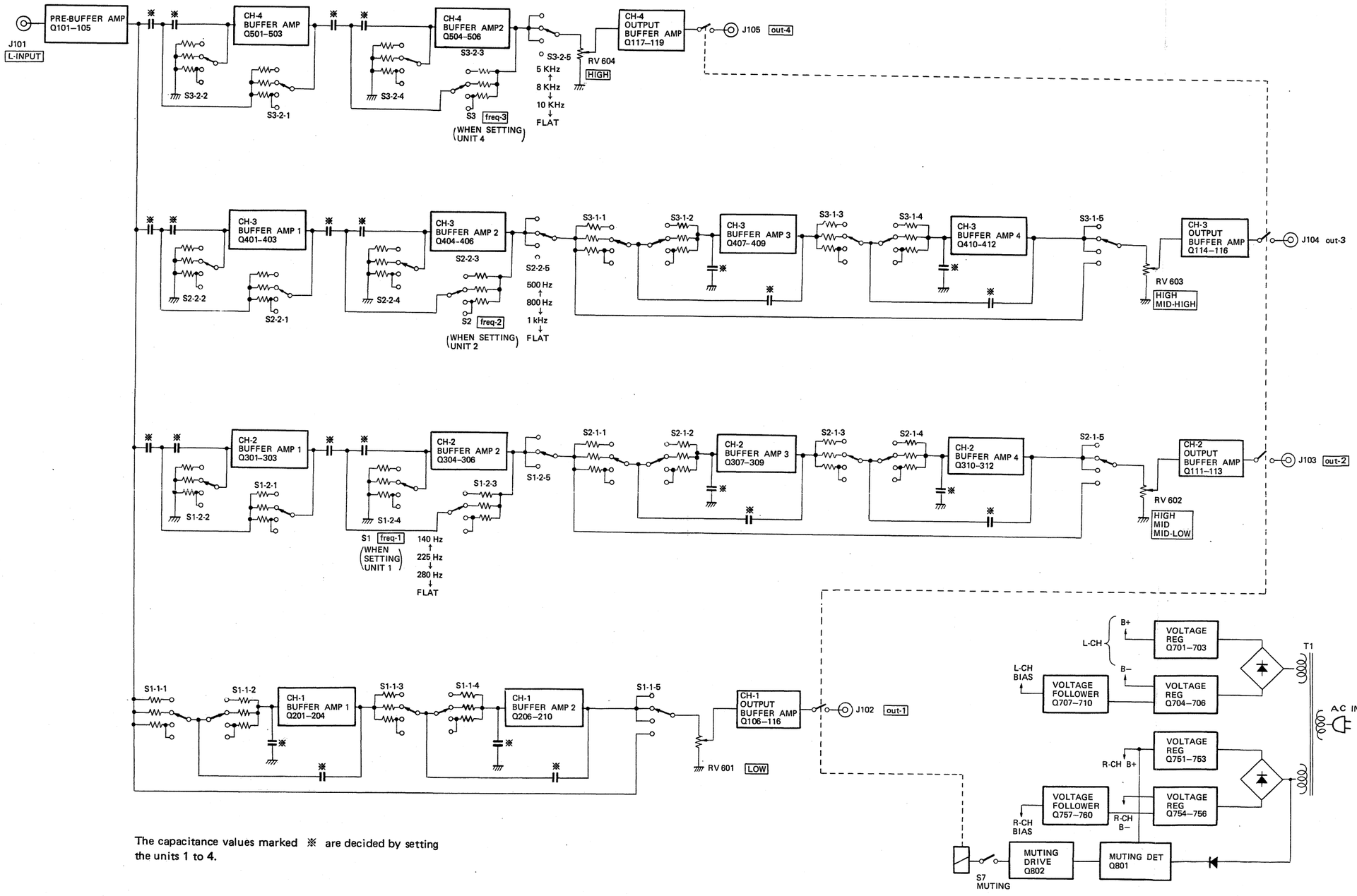


Fig. 5

1-2. BLOCK DIAGRAM



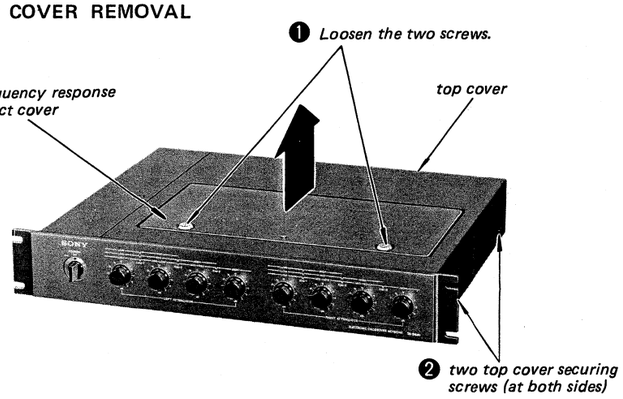
The capacitance values marked ※ are decided by setting the units 1 to 4.

SECTION 2
DISASSEMBLY

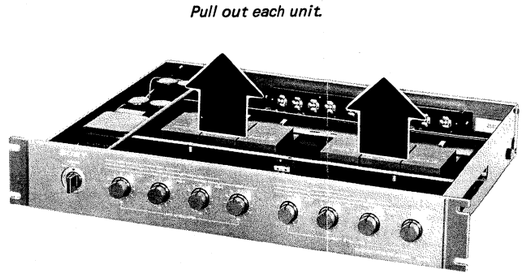
2-1. REMOVAL

Note: Follow the disassembly procedure in the numerical order given.

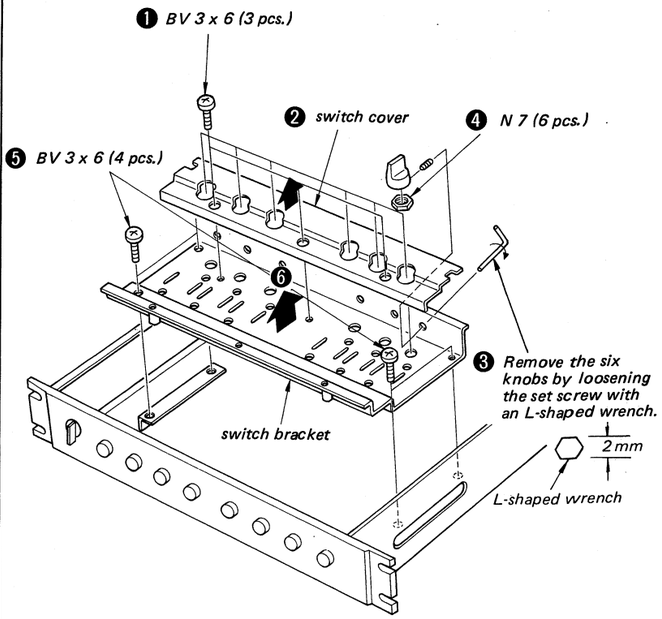
TOP COVER REMOVAL



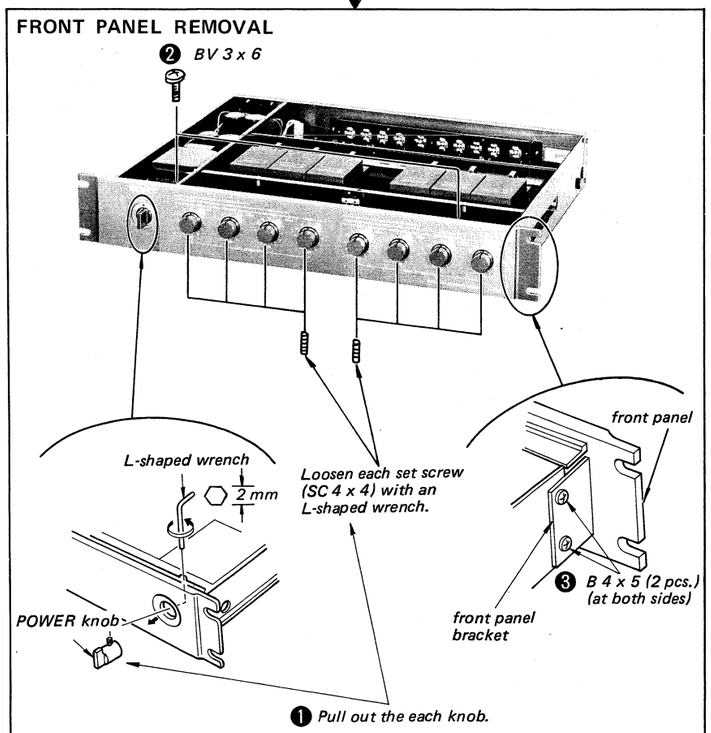
UNIT REMOVAL



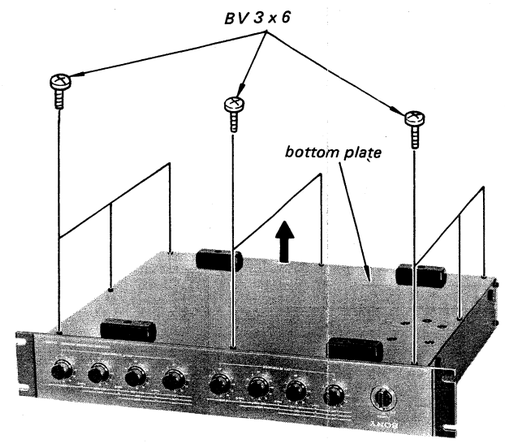
SWITCH COVER AND SWITCH BRACKET REMOVAL



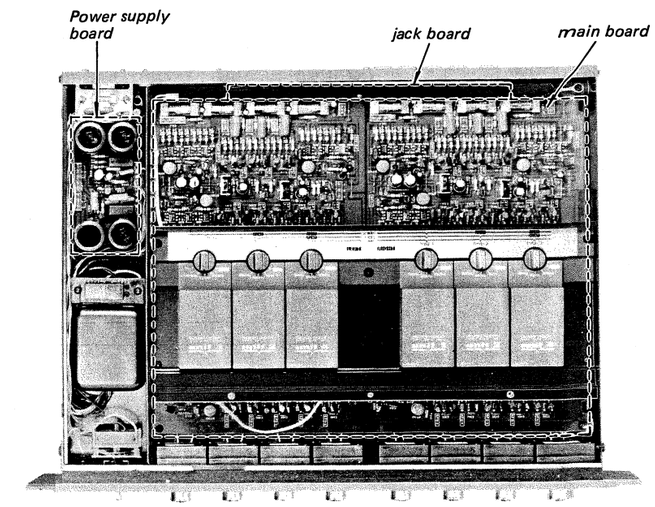
FRONT PANEL REMOVAL



BOTTOM PLATE REMOVAL



Each circuit board can be checked.



SECTION 3
ADJUSTMENTS

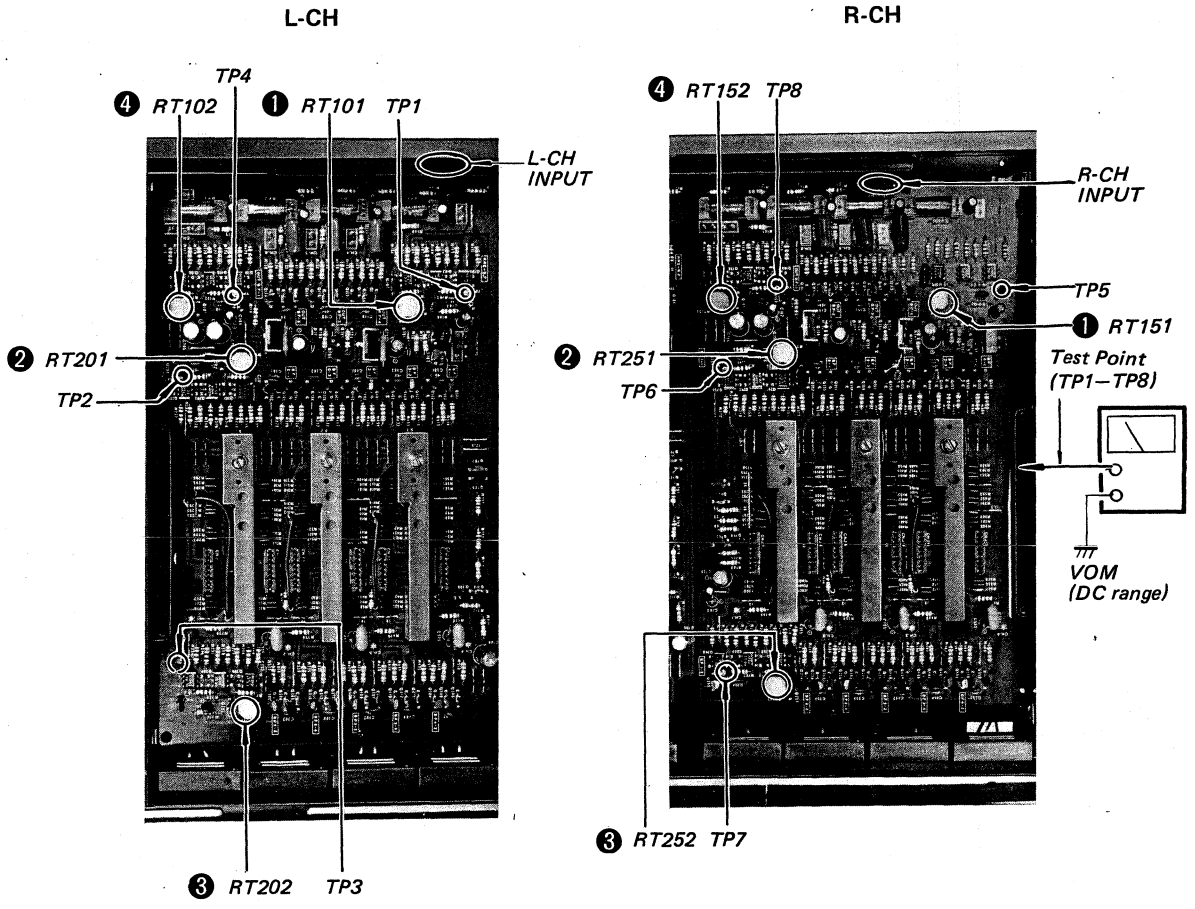
OFFSET ADJUSTMENT

- **Settings**
  POWER switch: ON
  LEFT, RIGHT ATTENUATOR: 0 dB (MAX)
- **Procedure**

1. Short-circuit both INPUT jacks.
2. Adjust each adjustable resistor in the numerical order (❶ – ❹) so that the VOM reads 0 V at each test point (TP1–8).

L-CH	R-CH
❶ RT101 (TP1)	❶ RT151 (TP5)
❷ RT201 (TP2)	❷ RT251 (TP6)
❸ RT202 (TP3)	❸ RT252 (TP7)
❹ RT102 (TP4)	❹ RT152 (TP8)

Specification: 0 V ± 0.1 mV



MUTING TIME CHECK

Check the operation of each relay (RY1–RY8).

1. **POWER Switch ON**
   Two or three seconds after turning the power switch on, RY1–RY8 are energized.
2. **POWER Switch OFF**
   RY1–RY8 are released at the moment POWER switch is turned off.

MEMO

SECTION 4
DIAGRAMS

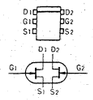
4-1. MOUNTING DIAGRAM

— Conductor Side —

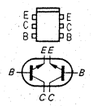
- **Replacement Semiconductors**

For replacement, use semiconductors except in ( ).

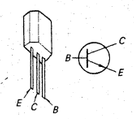
Q101, 151
Q106, 156
Q201, 251
Q206, 256 : 2SK97



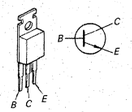
Q105, 155
Q110, 160
Q205, 255
Q210, 260 : 2SC1963



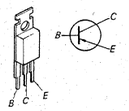
Q102, 152
Q107, 157
Q112, 162
Q115, 165
Q118, 168
Q202, 252
Q207, 257
Q302, 352
Q305, 355
Q308, 358
Q311, 361
Q402, 252
Q405, 455
Q408, 458
Q411, 461
Q502, 552
Q505, 555
Q703, 753
Q708, 758
Q709, 759
Q710, 760 : 2SC926A



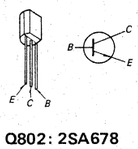
Q701, 751: 2SC1173



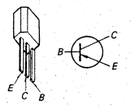
Q706, 756: 2SA473



Q801: 2SC1364 (2SC945)



Q802: 2SA678



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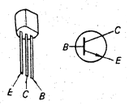

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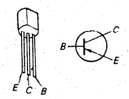
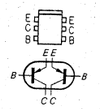
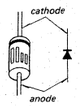


Q103, 153
Q108, 158
Q203, 253
Q208, 258 : 2SA884

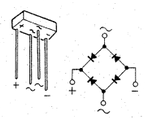


D701, 751
D702, 752: EQB01-16 (EQA01-16R)



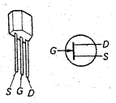
Q111, 161
Q114, 164
Q117, 167
Q301, 351
Q304, 354
Q307, 357
Q310, 360
Q401, 451
Q404, 454
Q407, 457
Q410, 460
Q501, 551
Q504, 554 : 2SK42-4 (2SK42)

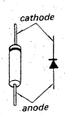
D801, 851: S1RB10



Q702, 752
Q705, 755
Q707, 757 : 2SK42-2 (2SK42)

D802: 10E2
D803: 1S1555





Q104, 154
Q109, 159
Q113, 163

Q	D

851

155,153,151 160,158,156 105,103,101 110,108,106

154,152,168,169,167,165,166,164,162,163,161,159,157
104,102,118,119,117,115,116,114,112,113,111,109,107 803

801, 802 802

753, 755, 756 703, 705, 706

751 754 701 704 751 702
752 752 801
752 702

252, 254 202, 204

551,553,552,457,459,458,451,453,452,357,359,358,351,353,352,251,253,255
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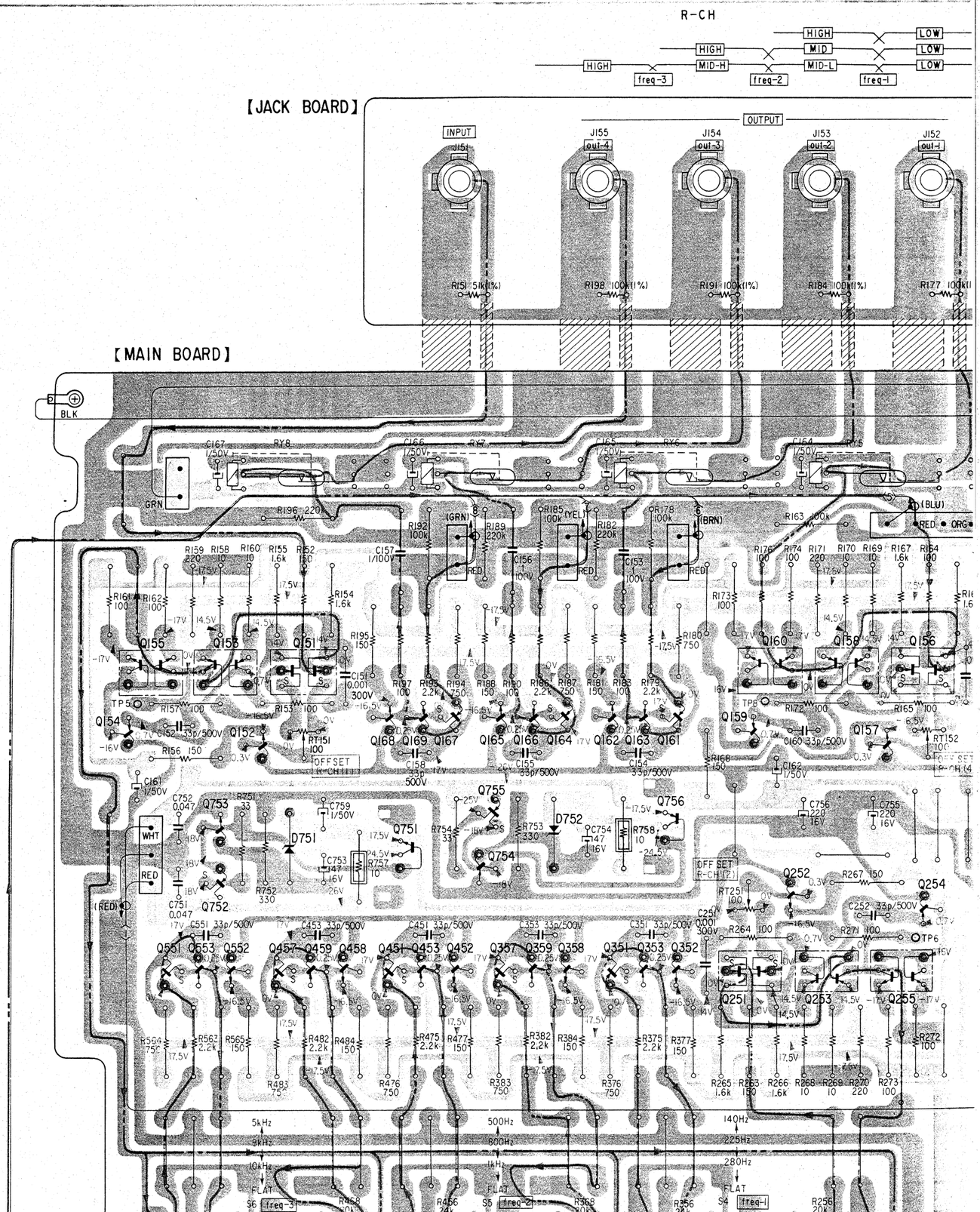
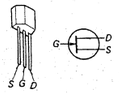
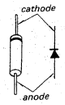
707

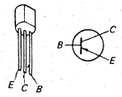
709







Q104, 154
Q109, 159
Q113, 163
Q116, 166
Q119, 169
Q204, 254
Q209, 259
Q303, 353
Q306, 356
Q309, 359 : 2SA639S (2SA893)
Q312, 362
Q403, 453
Q406, 456
Q409, 459
Q412, 462
Q503, 553
Q506, 556
Q704, 754



Note:

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- —[W]— : nonflammable resistor.
- : B + pattern
- : B — pattern

707

709

757

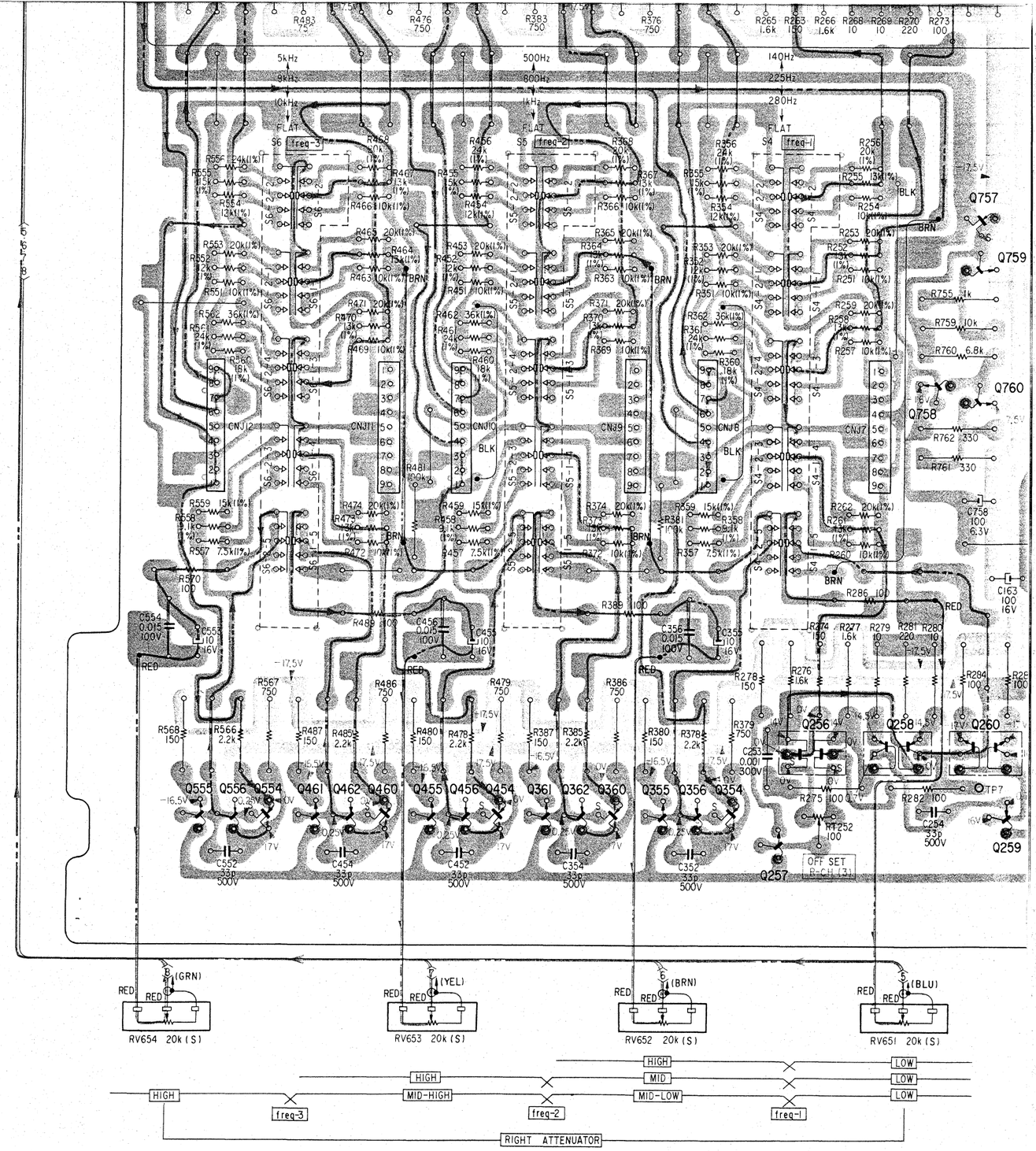
759

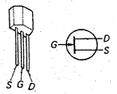
758 760

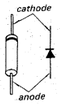
710 ,708

256, 258, 260 206, 208, 210

555,556,554,461,462,460,455,456,454,361,362,360,355,356,354,257,259
505,506,504,411,412,410,405,406,404,311,312,310,305,306,304,207,209

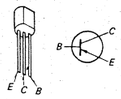






Q104, 154
Q109, 159
Q113, 163
Q116, 166
Q119, 169
Q204, 254
Q209, 259
Q303, 353
Q306, 356
Q309, 359
Q312, 362
Q403, 453
Q406, 456
Q409, 459
Q412, 462
Q503, 553
Q506, 556
Q704, 754

: 2SA639S (2SA893)



Note:

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- —[R]— : nonflammable resistor.
- : B + pattern
- : B — pattern

707

709

757

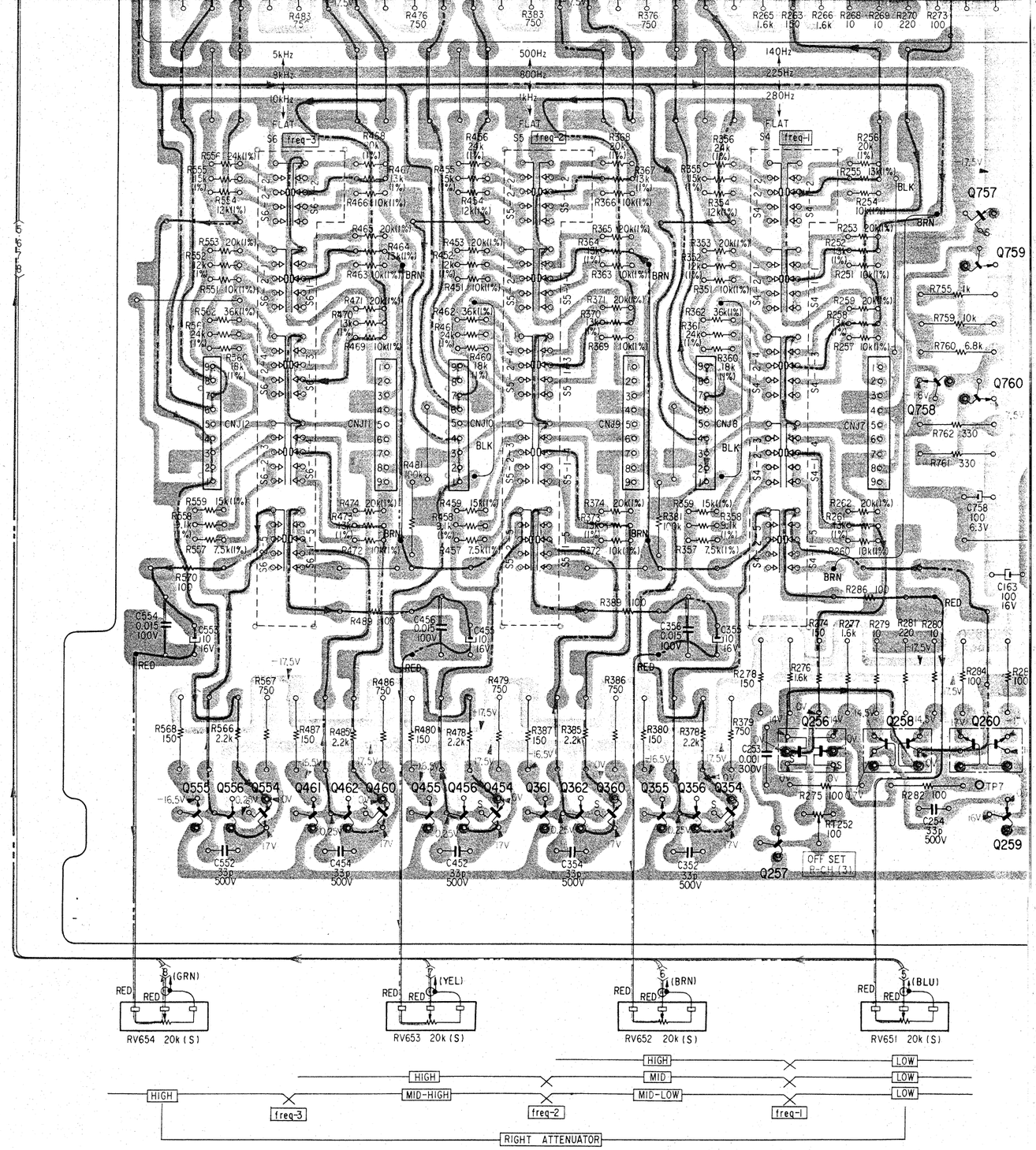
759

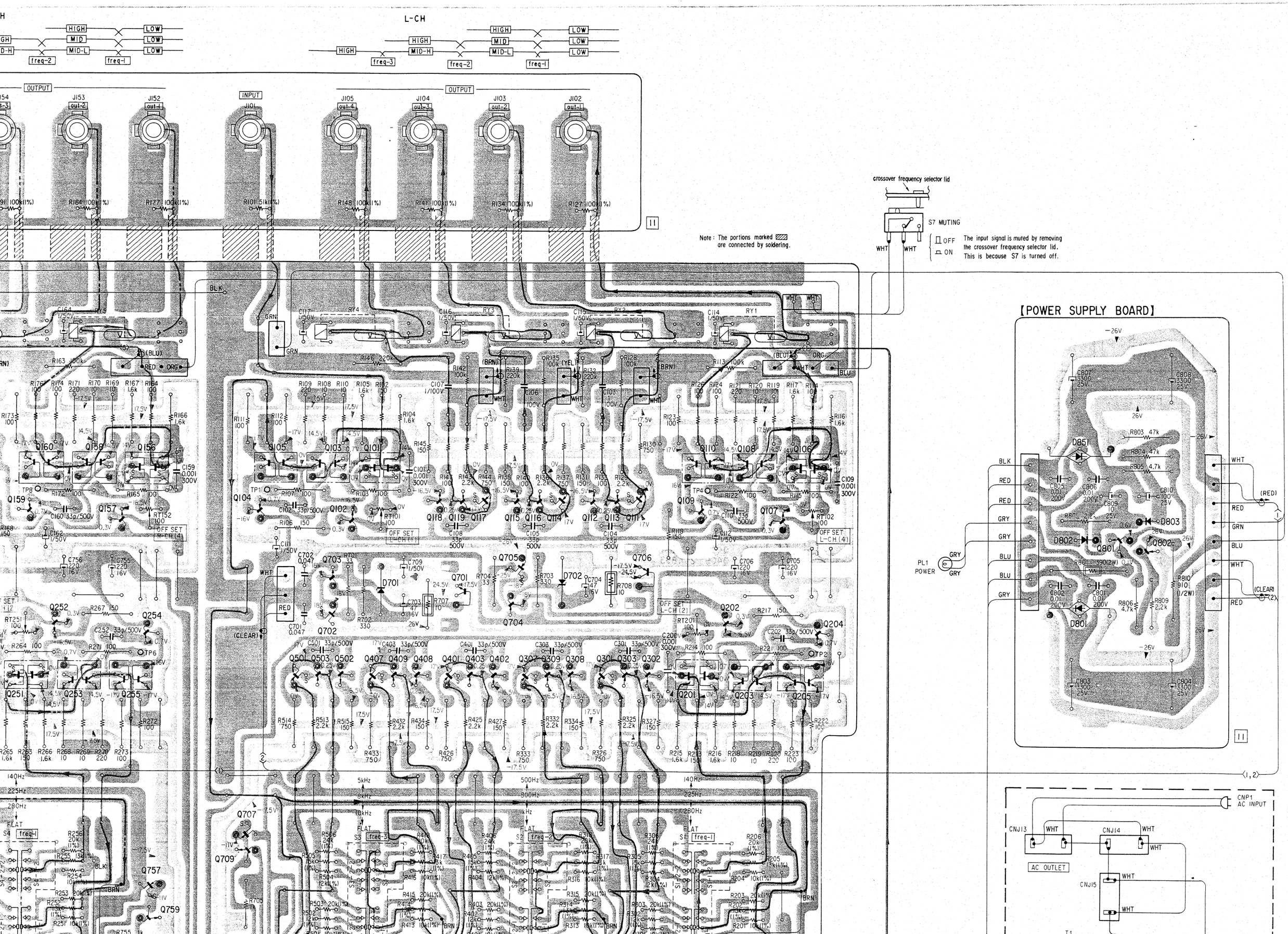
758 760

710 , 708

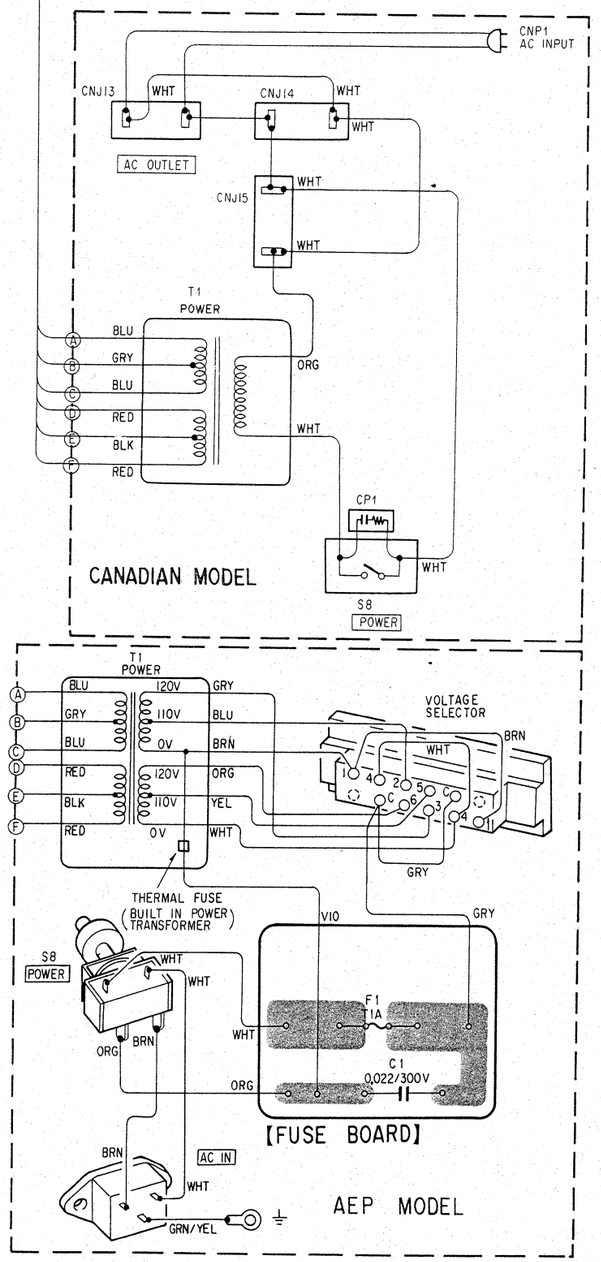
256, 258, 260 206, 208, 210

555,556,554,461,462,460,455,456,454,361,362,360,355,356,354,257,259
505,506,504,411,412,410,405,406,404,311,312,310,305,306,304,207,209

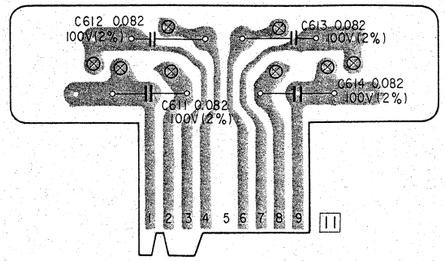



L-CH
HIGH
MID
MID-H
MID-L
LOW
freq-1
freq-2
freq-3
OUTPUT
INPUT
J101
J102
J103
J104
J105
J152
J153
J154
out-1
out-2
out-3
out-4
R101 51k(1%)
R127 100k(1%)
R134 100k(1%)
R141 100k(1%)
R148 100k(1%)
R184 100k(1%)
Note : The portions marked ▨ are connected by soldering.
crossover frequency selector lid
S7 MUTING
OFF
ON
The input signal is muted by removing the crossover frequency selector lid. This is because S7 is turned off.
WHT
【POWER SUPPLY BOARD】
PL1 POWER
GRY
D801
D802
D803
D851
Q801
Q802
R803 47k
R804 47k
R805 4.7k
R806 4.7k
R809 2.2k
R810 910 (1/2W)
C801 0.01 200V
C802 0.01 200V
C803 3300 25V
C804 3300 25V
C805 0.01 200V
C806 0.01 200V
C807 3300 25V
C808 3300 25V
C809 10 25V
C810 100 25V
-26V
26V
(RED)
GRN
BLU
(CLEAR)
CNP1
AC INPUT
CNJ13
CNJ14
CNJ15
AC OUTLET
T1
BLK
ORG
BRN
YEL
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q108
Q109
Q110
Q111
Q112
Q113
Q114
Q115
Q116
Q117
Q118
Q119
Q156
Q157
Q158
Q159
Q160
Q201
Q202
Q203
Q204
Q205
Q251
Q252
Q253
Q254
Q255
Q302
Q303
Q307
Q308
Q309
Q401
Q402
Q403
Q407
Q408
Q409
Q501
Q502
Q503
Q701
Q702
Q703
Q704
Q705
Q706
Q707
Q709
Q757
Q759
D701
D702
RY1
RY2
RY3
RY4
OFF SET L-CH (1)
OFF SET L-CH (2)
OFF SET L-CH (3)
OFF SET L-CH (4)
(1,2)

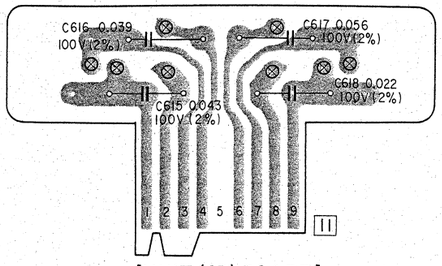
Q251
Q253
Q255
Q201
Q203
Q205
Q707
Q709
Q757
Q759
Q760
Q758
Q710
Q708
Q256
Q258
Q260
Q257
Q259
Q505 Q506 Q504
Q411 Q412 Q410
Q405 Q406 Q404
Q311 Q312 Q310
Q305 Q306 Q304
Q206
Q208
Q210
Q207
Q209
OFF SET (TECH USE)
RV651 20k (S)
RV604 20k (S)
RV603 20k (S)
RV602 20k (S)
RV601 20k (S)
freq-1
freq-3
freq-2
HIGH
MID-HIGH
MID
MID-LOW
LOW
LEFT ATTENUATOR


CNP1
AC INPUT
CNJ13
CNJ14
CNJ15
AC OUTLET
T1
POWER
CP1
S8
POWER
CANADIAN MODEL
VOLTAGE SELECTOR
THERMAL FUSE (BUILT IN POWER TRANSFORMER)
F1
T1A
C1
0.022/300V
【FUSE BOARD】
AC IN
AEP MODEL

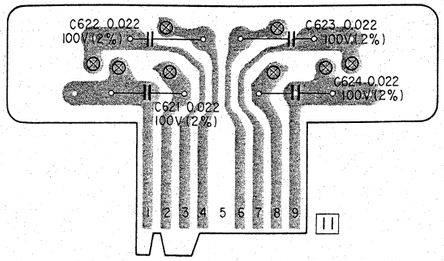
4-2. SCHEMATIC DIAGRAM



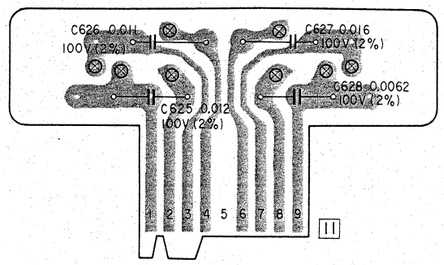
[UNIT (1A) BOARD]



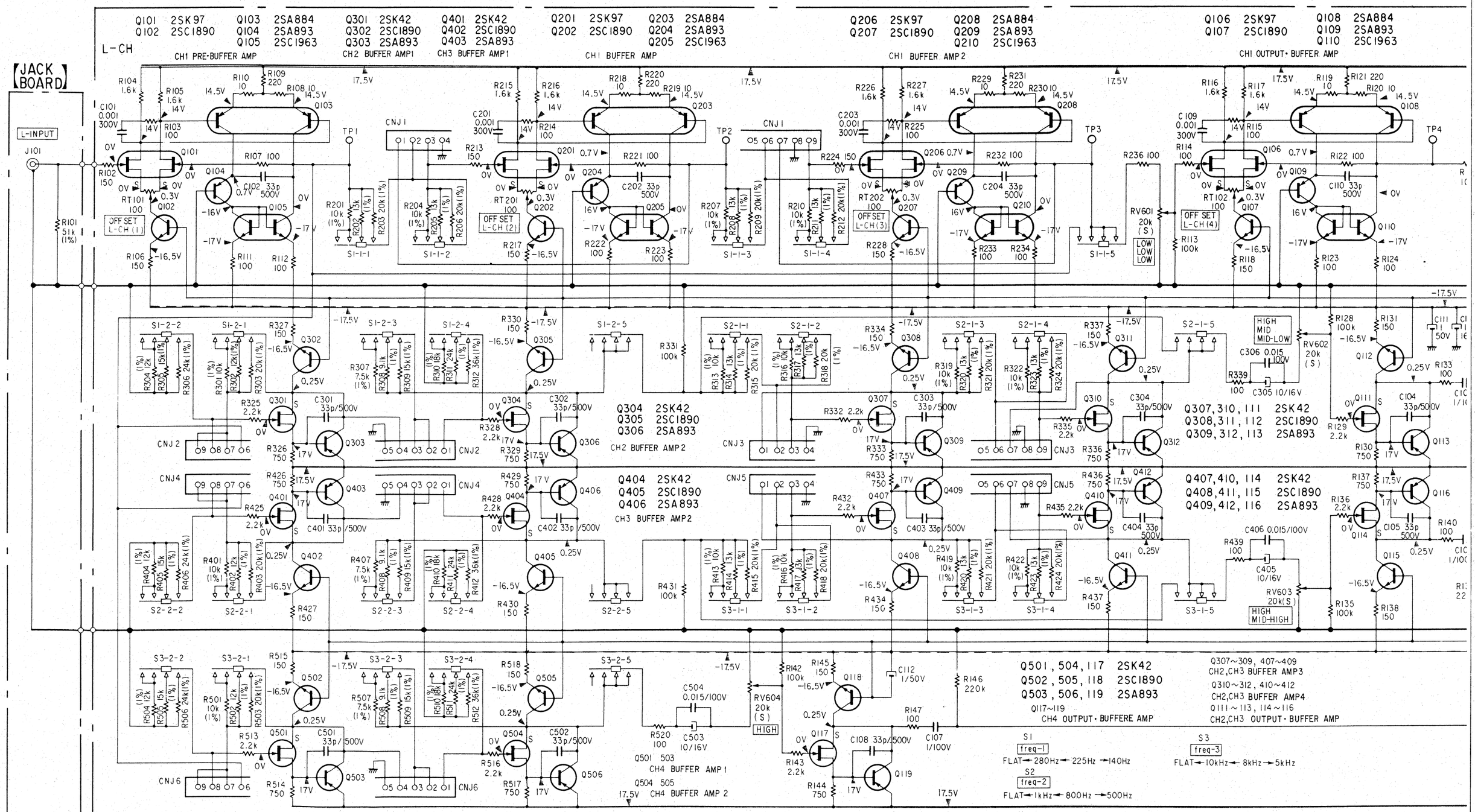
[UNIT (1B) BOARD]

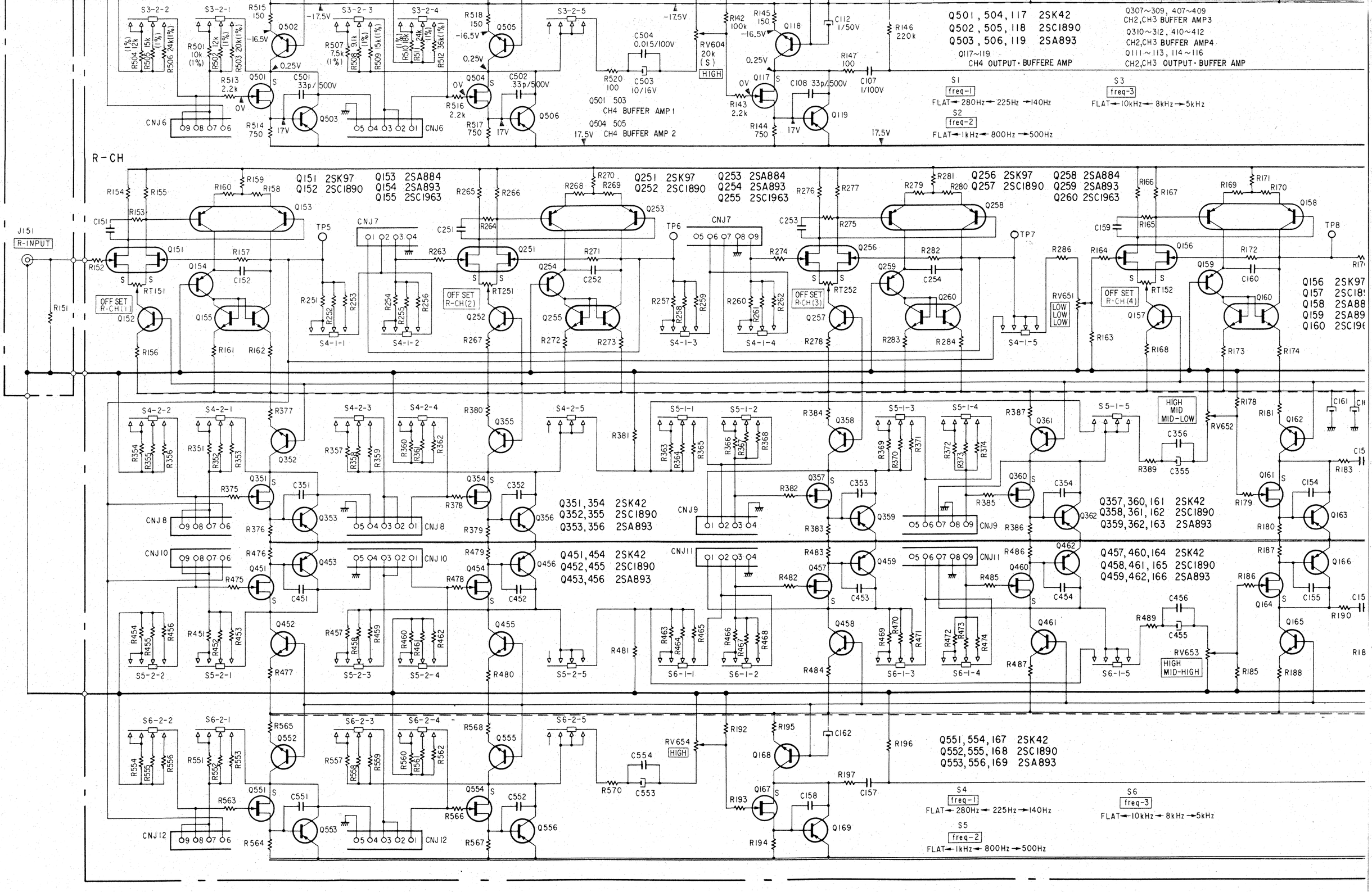


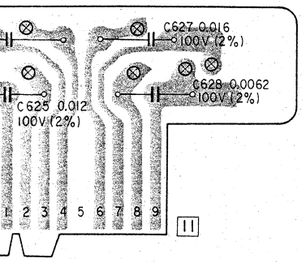
[UNIT (2A) BOARD]



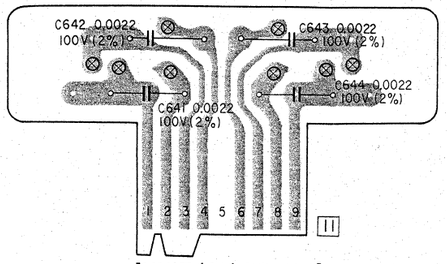
[UNIT (2B) BOARD]



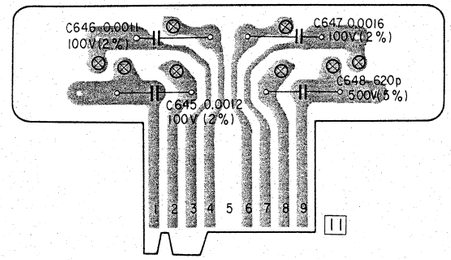

R-CH
Q501, 504, 117 2SK42
Q502, 505, 118 2SC1890
Q503, 506, 119 2SA893
Q117~119 CH4 OUTPUT·BUFFERE AMP
Q307~309, 407~409 CH2,CH3 BUFFER AMP3
Q310~312, 410~412 CH2,CH3 BUFFER AMP4
Q111~113, 114~116 CH2,CH3 OUTPUT·BUFFER AMP
Q501 503 CH4 BUFFER AMP1
Q504 505 CH4 BUFFER AMP 2
S1 freq-1 FLAT 280Hz 225Hz 140Hz
S2 freq-2 FLAT 1kHz 800Hz 500Hz
S3 freq-3 FLAT 10kHz 8kHz 5kHz
J151 R-INPUT
OFF SET R-CH(1)
OFF SET R-CH(2)
OFF SET R-CH(3)
OFF SET R-CH(4)
Q151 2SK97 Q153 2SA884
Q152 2SC1890 Q154 2SA893
Q155 2SC1963
Q251 2SK97 Q253 2SA884
Q252 2SC1890 Q254 2SA893
Q255 2SC1963
Q256 2SK97 Q258 2SA884
Q257 2SC1890 Q259 2SA893
Q260 2SC1963
Q156 2SK97
Q157 2SC18
Q158 2SA88
Q159 2SA89
Q160 2SC19
Q351, 354 2SK42
Q352, 355 2SC1890
Q353, 356 2SA893
Q357, 360, 161 2SK42
Q358, 361, 162 2SC1890
Q359, 362, 163 2SA893
Q451, 454 2SK42
Q452, 455 2SC1890
Q453, 456 2SA893
Q457, 460, 164 2SK42
Q458, 461, 165 2SC1890
Q459, 462, 166 2SA893
Q551, 554, 167 2SK42
Q552, 555, 168 2SC1890
Q553, 556, 169 2SA893
S4 freq-1 FLAT 280Hz 225Hz 140Hz
S5 freq-2 FLAT 1kHz 800Hz 500Hz
S6 freq-3 FLAT 10kHz 8kHz 5kHz
HIGH
MID-HIGH
MID-LOW
LOW LOW LOW
CNJ6
CNJ7
CNJ8
CNJ9
CNJ10
CNJ11
CNJ12
TP5
TP6
TP7
TP8



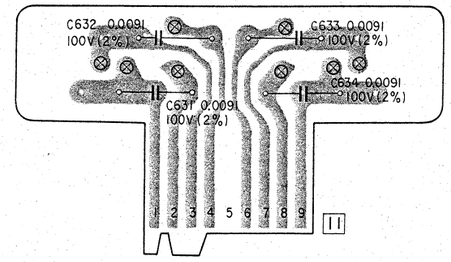
[UNIT (2B) BOARD]



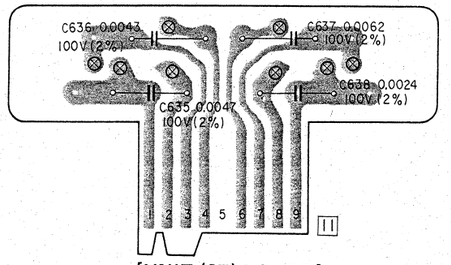
[UNIT (4A) BOARD]



[UNIT (4B) BOARD]

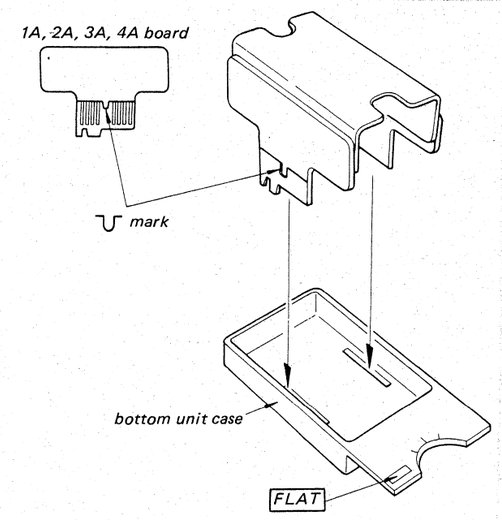


[[UNIT (3A) BOARD]

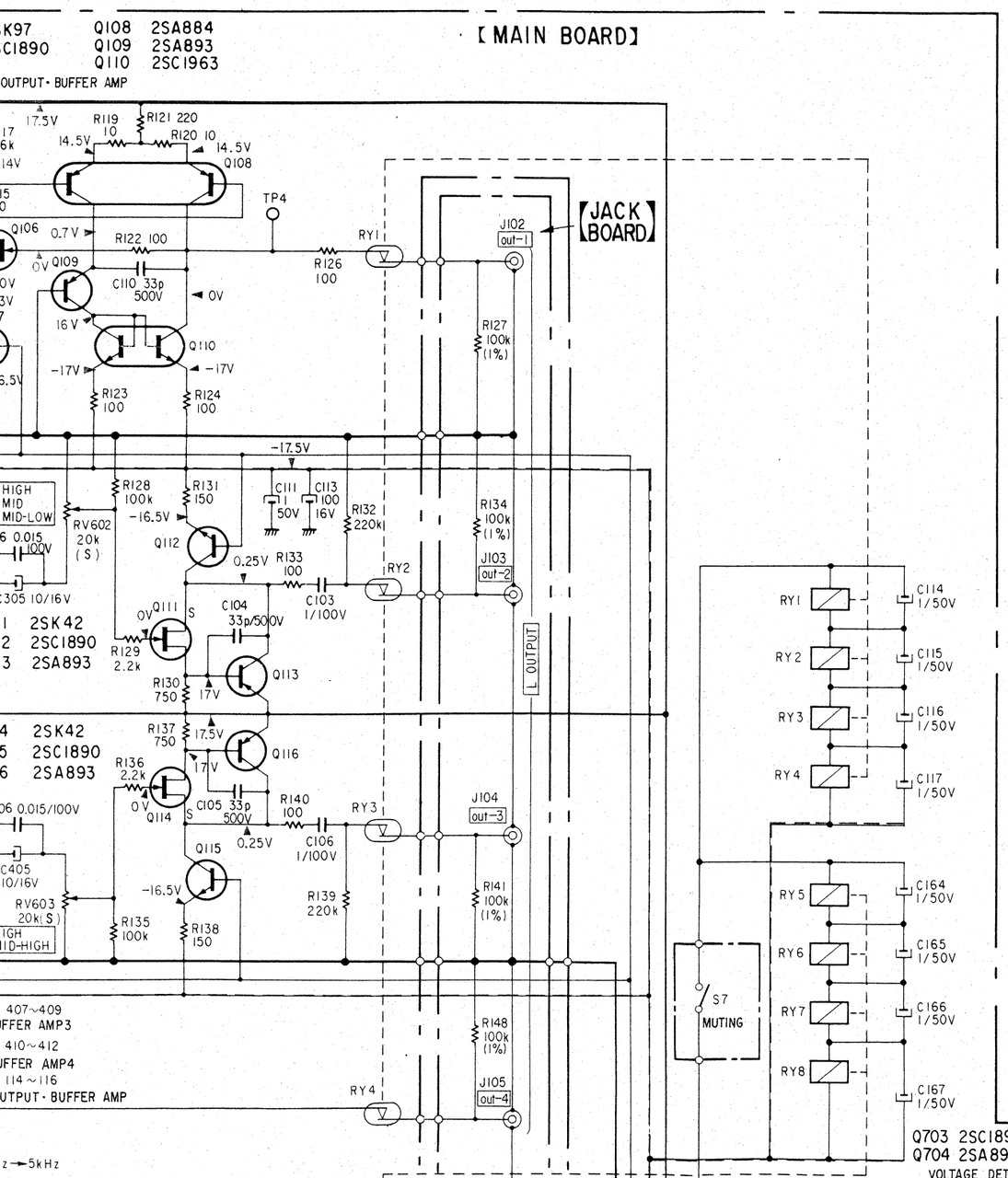


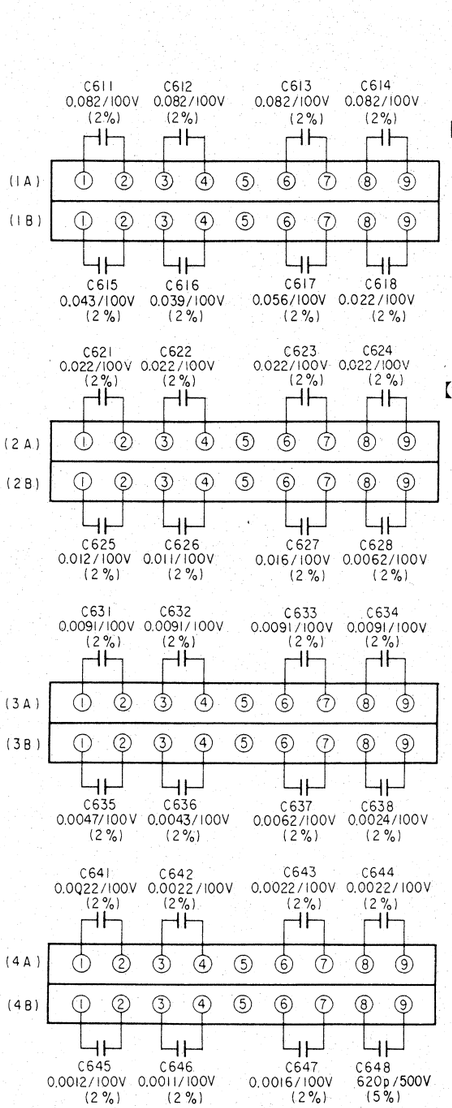
[UNIT (3B) BOARD]

Note: Install the A board in the bottom unit case, face in the direction indicated.



[MAIN BOARD]





【UNIT (1A, 1B) BOARD】

CROSSOVER FREQUENCY
140Hz
225Hz
280Hz

【UNIT (2A, 2B) BOARD】

CROSSOVER FREQUENCY
500Hz
800Hz
1kHz

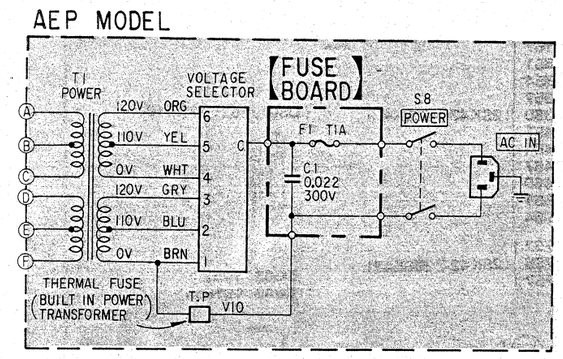
【UNIT (3A, 3B) BOARD】

CROSSOVER FREQUENCY
1.25kHz
2kHz
2.5kHz

【UNIT (4A, 4B) BOARD】

CROSSOVER FREQUENCY
5kHz
8kHz
10kHz

AEP MODEL

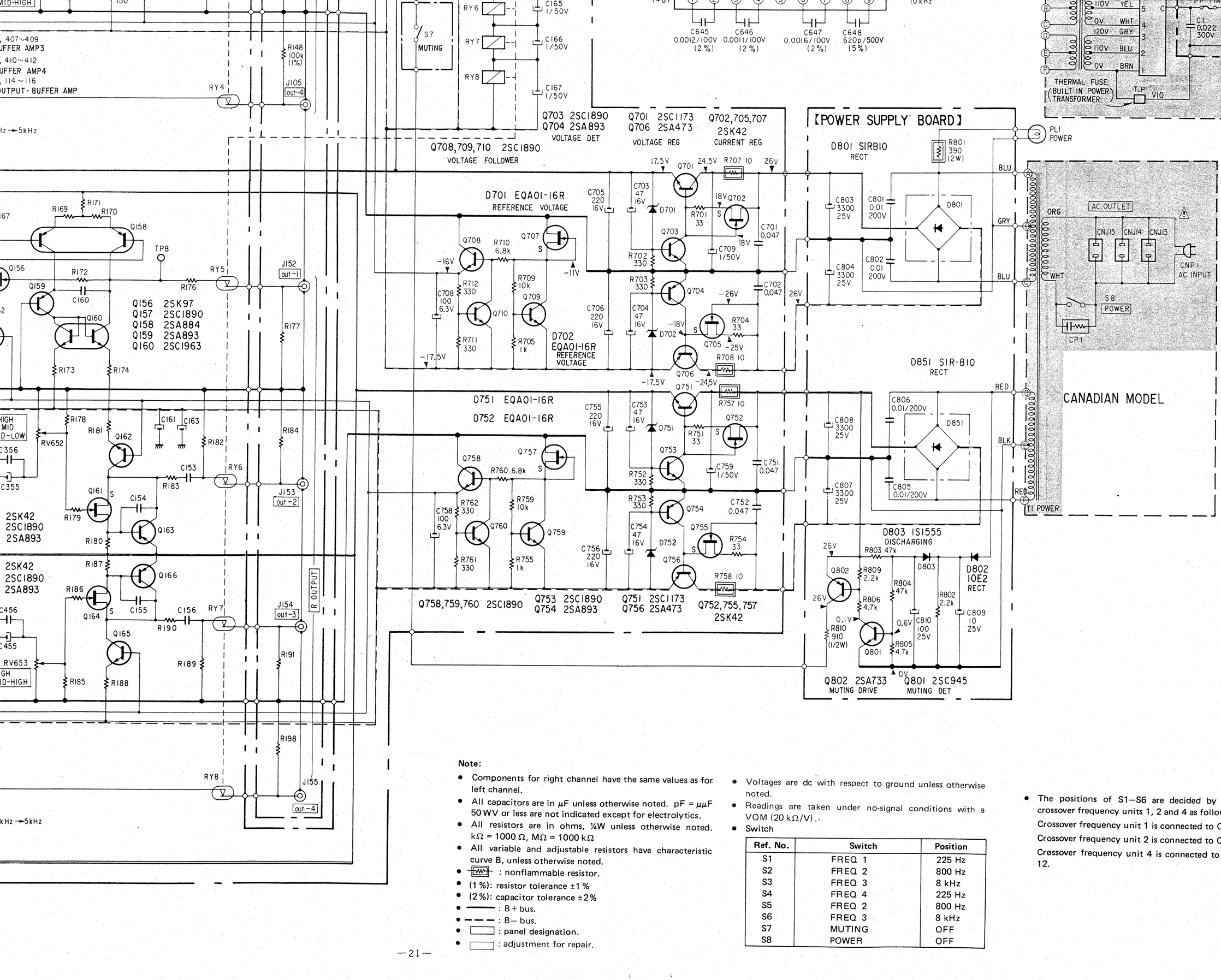


Q703 2SC1890
Q704 2SA893
VOLTAGE DET

Q701 2SC1173
Q706 2SA473
VOLTAGE REG

Q702,705,707
2SK42
CURRENT REG

Q708,709,710 2SC1890



Note:

- Components for right channel have the same values as for left channel.
- All capacitors are in μF unless otherwise noted. pF = μμF 50 WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ = 1000 Ω, MΩ = 1000 kΩ
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- (1 %): resistor tolerance ±1 %
- (2 %): capacitor tolerance ±2%
- ——— : B+ bus.
- - - - : B− bus.
- ▭ : panel designation.
- ▭ : adjustment for repair.

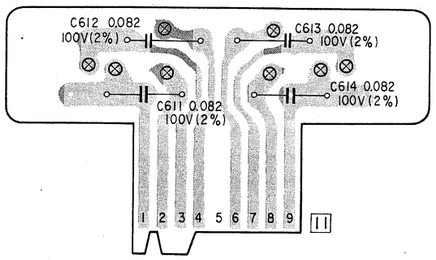
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (20 kΩ/V).
- Switch

Ref. No.	Switch	Position
S1	FREQ 1	225 Hz
S2	FREQ 2	800 Hz
S3	FREQ 3	8 kHz
S4	FREQ 4	225 Hz
S5	FREQ 2	800 Hz
S6	FREQ 3	8 kHz
S7	MUTING	OFF
S8	POWER	OFF

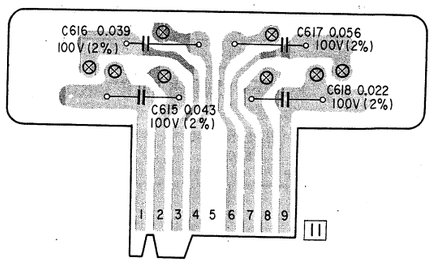
- The positions of S1—S6 are decided by installing the crossover frequency units 1, 2 and 4 as follows.
  Crossover frequency unit 1 is connected to CNJ1, 7, 2, 8.
  Crossover frequency unit 2 is connected to CNJ3, 9, 4, 10.
  Crossover frequency unit 4 is connected to CNJ5, 11, 6, 12.

4-3. UNIT BOARD DIAGRAM

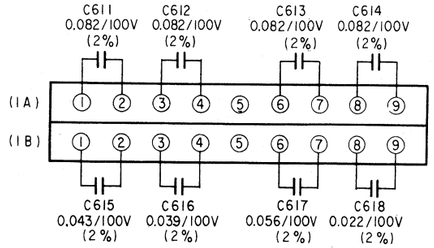
【UNIT (1A, 1B) BOARD】



[UNIT (1A) BOARD]



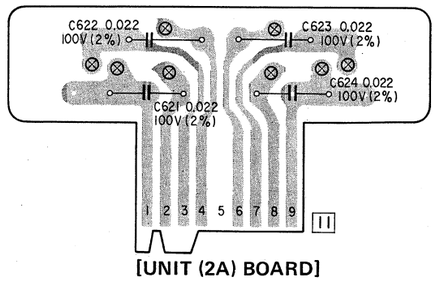
[UNIT (1B) BOARD]



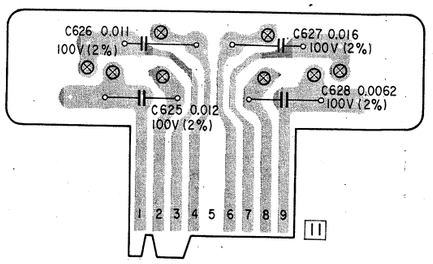
【UNIT (1A, 1B) BOARD】

CROSSOVER FREQUENCY
140Hz
225Hz
280Hz

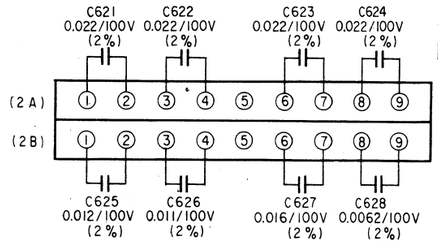
【UNIT (2A, 2B) BOARD】



[UNIT (2A) BOARD]



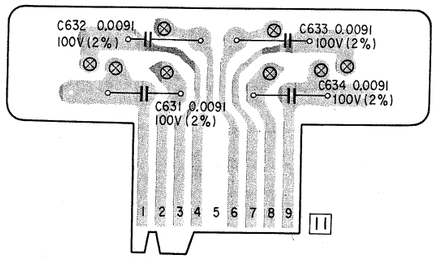
[UNIT (2B) BOARD]



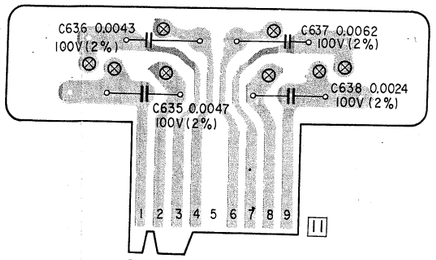
【UNIT (2A, 2B) BOARD】

CROSSOVER FREQUENCY
500Hz
800Hz
1kHz

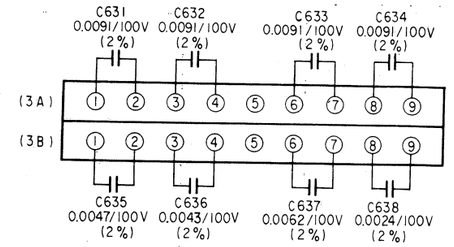
【UNIT (3A, 3B) BOARD】



[[UNIT (3A) BOARD]



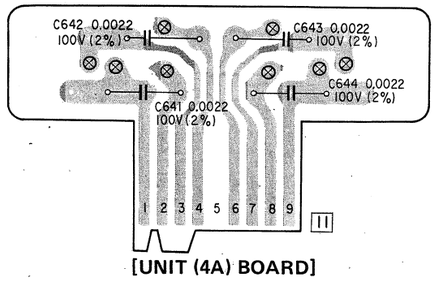
[UNIT (3B) BOARD]



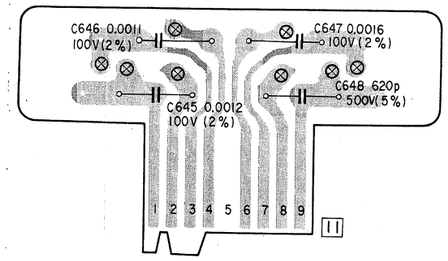
【UNIT (3A, 3B) BOARD】

CROSSOVER FREQUENCY
1.25kHz
2kHz
2.5kHz

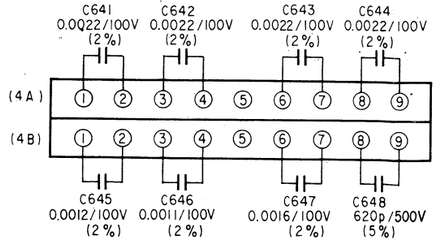
【UNIT (4A,4B) BOARD】



[UNIT (4A) BOARD]



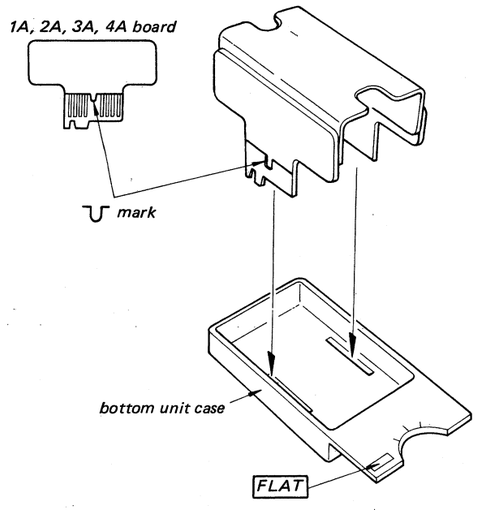
[UNIT (4B) BOARD]



【UNIT (4A,4B) BOARD】

CROSSOVER FREQUENCY
5kHz
8kHz
10kHz

Note: Install the A board in the bottom unit case, face in the direction indicated.



SECTION 5

EXPLODED VIEWS

5-1.

A4464-083-A Ⓞ
Unit (1) Ass'y, including parts marked ● 1–4, ♦ 1

A-4464-084-A Ⓞ
Unit (2) Ass'y, including parts marked ■ 1–4, ♦ 1

A-4464-086-A Ⓞ
Unit (3) Ass'y, including parts marked ★ 1–4, ♦ 1 (Optional Accessory)

A-4464-085-A Ⓞ
Unit (4) Ass'y, including parts marked ▲ 1–4, ♦1

- ●4 1-586-854-00 Ⓔ Printed Circuit Board, Unit 1B
- ■4 1-586-856-00 Ⓔ Printed Circuit Board, Unit 2B
- ★4 1-586-858-00 Ⓔ Printed Circuit Board, Unit 3B (Optional Accessroy)
- ▲4 1-586-860-00 Ⓔ Printed Circuit Board, Unit 4B
- ●1 4-854-435-01 Ⓑ Unit Case (1), upper
- ■1 4-854-435-11 Ⓑ Unit Case (2), upper
- ★1 4-854-435-21 Ⓑ Unit Case (3), upper (Optional Accessory)
- ▲1 4-854-435-31 Ⓑ Unit Case (4), upper
- ▲2 4-854-422-31 Ⓑ Unit Case (4), bottom
- ●2 4-854-422-01 Ⓑ Unit Case (1), bottom
- ■2 4-854-422-11 Ⓑ Unit Case (2), bottom
- ★2 4-854-422-21 Ⓑ Unit Case (3), bottom (Optional Accessory)
- ♦1 4-854-402-00 Ⓑ Bracket, Unit
- BV 3 x 5
- 1-518-331-81 Ⓑ Lamp 6.0 V 35 mA; POWER (PL1)
- 4-852-933-00 Ⓐ Holder, lamp
- 1-226-216-11 Ⓕ Resistor, variable 20 kΩ/20 kΩ; LEFT ATTENUATOR (RV651–654)
- ⚠ 1-552-294-12 (Canadian model)
- 1-552-295-12 (AEP model) Ⓕ Switch, rotary; POWER (S8)
- Bracket, power switch
- Supplied with POWER switch
- 4-847-803-00 Ⓐ Screw, case
- 4-854-428-00 Ⓙ Cover, top
- X-4854-406-0 Ⓖ Cover Ass'y, frequency response select
- 4-854-403-00 Ⓓ Screw
- 3-701-438-11 Ⓐ Washer, plastic; 2.5 mm dia.
- 4-854-404-00 Ⓐ Protector
- 4-854-437-00 Ⓕ Ornamental Plate
- 4-854-433-00 Ⓐ Cushion
- 4-854-434-00 Ⓑ Cushion, Unit
- 4-847-802-00 Ⓐ Screw, case
- 3-831-441-XX Ⓐ Tape, t 0.5
- ●3 1-586-853-00 Ⓔ Printed Circuit Board, Unit 1A
- ■3 1-586-855-00 Ⓔ Printed Circuit Board, Unit 2A
- ★3 1-586-857-00 Ⓔ Printed Circuit Board, Unit 3A (Optional Accessroy)
- ▲3 1-586-859-00 Ⓔ Printed Circuit Board, Unit 4A
- 3-703-108-21 Ⓐ BV 3 x 6, w/flange
- P 3 x 12
- B 4 x 5
- Bracket, front panel; left
- P 2.6 x 5
- 3-703-108-21 Ⓐ BV 3 x 6, w/flange
- 3-701-431-21 Ⓐ Nut, 8 mm dia.
- B 3 x 3
- Sub-Chassis
- 1-226-216-11 Ⓕ Resistor, variable 20 kΩ/ 20 kΩ; RIGHT ATTENUATOR (RV601–604)
- 4-854-427-00 Ⓖ Plate, bottom
- 3-703-108-21 Ⓐ BV 3 x 6, w/flange
- X-4852-903-0 Ⓑ Foot Ass'y
- BV 3 x 8
- 3-703-108-21 Ⓐ BV 3 x 6, w/flange
- X-4852-901-0 Ⓔ Kbob Ass'y, POWER
- SC4 x 4
- 4-852-925-00 Ⓐ Lens, power lamp
- 4-852-923-00 Ⓒ Ornamental Ring, POWER switch
- X-4854-402-0 Ⓒ Knob Ass'y, LEFT ATTENUATOR
- X-4854-402-0 Ⓒ Knob Ass'y, RIGHT ATTENUATOR
- 4-854-425-00 Ⓒ Panel, front
- Bracket, front panel; right

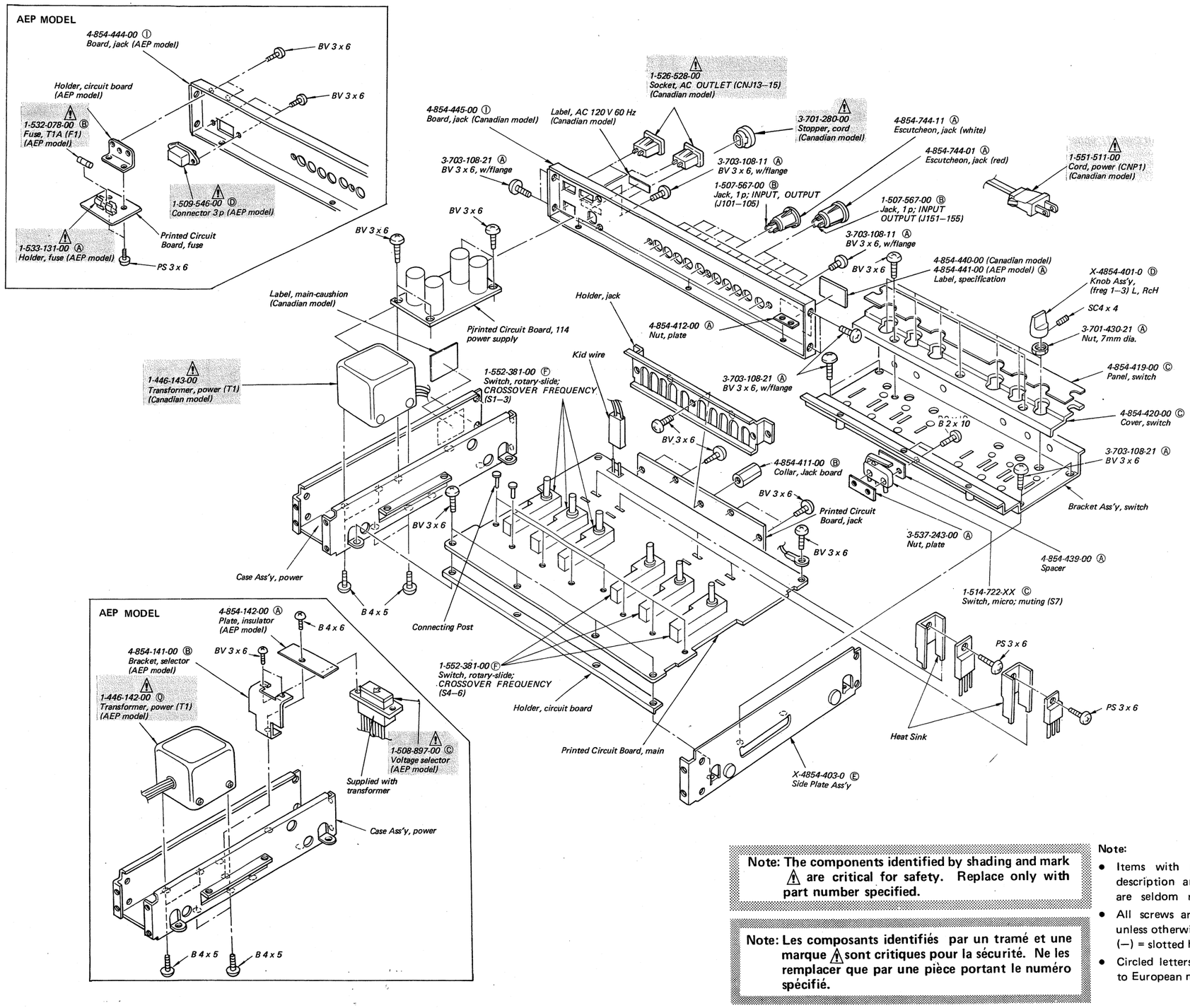
Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-2.



Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

SECTION 6

ELECTRICAL PARTS LIST

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*	*Description*
		PRINTED CIRCUIT BOARDS
	1-586-853-00	Ⓔ Unit 1A
	1-586-854-00	Ⓔ Unit 1B
	1-586-855-00	Ⓔ Unit 2A
	1-586-856-00	Ⓔ Unit 2B
	1-586-857-00	Ⓔ Unit 3A
	1-586-858-00	Ⓔ Unit 3B
	1-586-859-00	Ⓔ Unit 4A
	1-586-860-00	Ⓔ Unit 4B
		SEMICONDUCTORS
		Transistors
Q101, 151	8-765-342-31	Ⓕ 2SK97
⇒Q102, 152	8-720-950-03	Ⓒ 2SC926A
Q103, 153	8-765-020-00	Ⓓ 2SA884
⇒Q104, 154	8-729-163-93	Ⓒ 2SA639S
Q105, 155	8-765-222-20	Ⓓ 2SC1963
Q106, 156	8-765-342-31	Ⓕ 2SK97
⇒Q107, 157	8-720-950-03	Ⓒ 2SC926A
Q108, 158	8-765-020-00	Ⓓ 2SA884
⇒Q109, 159	8-729-163-93	Ⓒ 2SA639S
Q110, 160	8-765-222-20	Ⓓ 2SC1963
⇒Q111, 161	8-727-314-00	Ⓔ 2SK42-4
⇒Q112, 162	8-720-950-03	Ⓒ 2SC926A
⇒Q113, 163	8-729-163-93	Ⓒ 2SA639S
⇒Q114, 164	8-727-314-00	Ⓔ 2SK42-4
⇒Q115, 165	8-720-950-03	Ⓒ 2SC926A
⇒Q116, 166	8-729-163-93	Ⓒ 2SA639S
⇒Q117, 167	8-727-314-00	Ⓔ 2SK42-4
⇒Q118, 168	8-720-950-03	Ⓒ 2SC926A
⇒Q119, 169	8-729-163-93	Ⓒ 2SA639S
Q201, 251	8-765-342-31	Ⓕ 2SK97
⇒Q202, 252	8-720-950-03	Ⓒ 2SC926A
Q203, 253	8-765-020-00	Ⓓ 2SA884
⇒Q204, 254	8-729-163-93	Ⓒ 2SA639S
Q205, 255	8-765-222-20	Ⓓ 2SC1963
Q206, 256	8-765-342-31	Ⓕ 2SK97
⇒Q207, 257	8-720-950-03	Ⓒ 2SC926A
Q208, 258	8-765-020-00	Ⓓ 2SA884
⇒Q209, 259	8-729-163-93	Ⓒ 2SA639S
Q210, 260	8-765-222-20	Ⓓ 2SC1963
⇒Q301, 351	8-727-314-00	Ⓔ 2SK42-4
⇒Q302, 352	8-720-950-03	Ⓒ 2SC926A
⇒Q303, 353	8-729-163-93	Ⓒ 2SA639S
⇒Q304, 354	8-727-314-00	Ⓔ 2SK42-4
⇒Q305, 355	8-720-950-03	Ⓒ 2SC926A
⇒Q306, 356	8-729-163-93	Ⓒ 2SA639S
⇒Q307, 357	8-727-314-00	Ⓔ 2SK42-4
⇒Q308, 358	8-720-950-03	Ⓒ 2SC926A
⇒Q309, 359	8-729-163-93	Ⓒ 2SA639S
⇒Q310, 360	8-727-314-00	Ⓔ 2SK42-4
⇒Q311, 361	8-720-950-03	Ⓒ 2SC926A
⇒Q312, 362	8-729-163-93	Ⓒ 2SA639S
⇒Q401, 451	8-727-314-00	Ⓔ 2SK42-4
⇒Q402, 452	8-720-950-03	Ⓒ 2SC926A
⇒Q403, 453	8-729-163-93	Ⓒ 2SA639S
⇒Q404, 454	8-727-314-00	Ⓔ 2SK42-4
⇒Q405, 455	8-720-950-03	Ⓒ 2SC926A
⇒Q406, 456	8-729-163-93	Ⓒ 2SA639S
⇒Q407, 457	8-727-314-00	Ⓔ 2SK42-4
⇒Q408, 458	8-720-950-03	Ⓒ 2SC926A
⇒Q409, 459	8-729-163-93	Ⓒ 2SA639S
⇒Q410, 460	8-727-314-00	Ⓔ 2SK42-4
⇒Q411, 461	8-720-950-03	Ⓒ 2SC926A
⇒Q412, 462	8-729-163-93	Ⓒ 2SA639S
⇒Q501, 551	8-727-314-00	Ⓔ 2SK42-4
⇒Q502, 552	8-720-950-03	Ⓒ 2SC926A
⇒Q503, 553	8-729-163-93	Ⓒ 2SA639S
⇒Q504, 554	8-727-314-00	Ⓔ 2SK42-4
⇒Q505, 555	8-720-950-03	Ⓒ 2SC926A
⇒Q506, 556	8-729-163-93	Ⓒ 2SA639S

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description
Q701, 751	8-729-217-33	Ⓒ 2SC1173
⇒Q702, 752	8-727-312-00	Ⓒ 2SK42-2
⇒Q703, 753	8-720-950-03	Ⓒ 2SC926A
⇒Q704, 754	8-729-163-93	Ⓒ 2SA639S
⇒Q705, 755	8-727-312-00	Ⓒ 2SK42-2
Q706, 756	8-729-247-33	Ⓒ 2SA473
⇒Q707, 757	8-727-312-00	Ⓒ 2SK42-2
⇒Q708–710, ⇒Q758–760	8-729-950-03	Ⓒ 2SC926A
⇒Q801	8-729-663-47	Ⓑ 2SC1364
⇒Q802	8-727-788-00	Ⓑ 2SA678

Diodes

⇒D701, 751, ⇒D702, 752	8-719-931-16	Ⓑ EQB01-16
D801, 851	8-719-510-10	Ⓒ S1RB10
D802	8-719-200-02	Ⓑ 10E2
D803	8-719-815-55	Ⓑ 1S1555

CAPACITORS

All capacitors are in μF and polyethylene unless otherwise noted. 5WV or less are not indicated except for electrolytics. pF = μμF, elect = electrolytic

C1	⚠1-108-777-11	Ⓑ 0.022	300 V	metalized film (AEP model)
C101, 151	1-109-170-11	Ⓒ 0.001	300 V	mica
C102, 152	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C103, 153	1-130-083-11	Ⓒ 1	100 V	
C104, 154, C105, 155	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C106, 156, C107, 157	1-130-083-11	Ⓒ 1	100 V	
C108, 158	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C109, 159	1-109-170-11	Ⓒ 0.001	300 V	mica
C110, 160	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C111, 161, C112, 162	1-121-391-11	Ⓐ 1	50 V	elect
C113, 163	1-121-415-11	Ⓐ 100	16 V	elect
C114–117, C164–167	1-121-391-11	Ⓐ 1	50 V	elect
C201, 251	1-109-170-11	Ⓒ 0.001	300 V	mica
C202, 252	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C203, 253	1-109-170-11	Ⓒ 0.001	300 V	mica
C204, 254	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C301–304, C351–354	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C305, 355	1-131-371-11	Ⓑ 10	16 V	tantalum
C306, 356	1-130-127-11	Ⓑ 0.015	100 V	
C401 –404, C451–454	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C405, 455	1-131-371-11	Ⓑ 10	16 V	tantalum
C406, 456	1-130-127-11	Ⓑ 0.015	100 V	
C501, 502, C551, 552	1-107-159-11	Ⓐ 33 p	500 V	silvered mica
C503, 553	1-131-371-11	Ⓑ 10	16 V	tantalum
C504, 554	1-130-127-11	Ⓑ 0.015	100 V	
C611–614	1-130-175-11	Ⓑ 0.082	100 V	
C615	1-130-174-11	Ⓑ 0.043	100 V	
C616	1-130-173-11	Ⓑ 0.039	100 V	
C617	1-130-126-11	Ⓑ 0.056	100 V	
C618	1-130-172-11	Ⓑ 0.022	100 V	
C621–624	1-130-172-11	Ⓑ 0.022	100 V	
C625	1-130-171-11	Ⓑ 0.012	100 V	
C626	1-130-170-11	Ⓑ 0.011	100 V	
C627	1-130-125-11	Ⓑ 0.016	100 V	
C628	1-130-168-11	Ⓑ 0.0062	100 V	
C631–634	1-130-169-11	Ⓑ 0.0091	100 V	
C635	1-130-167-11	Ⓑ 0.0047	100 V	
C636	1-130-123-11	Ⓑ 0.0043	100 V	
C637	1-130-168-11	Ⓑ 0.0062	100 V	
C638	1-130-166-11	Ⓑ 0.0024	100 V	
C641–644	1-130-165-11	Ⓑ 0.0022	100 V	
C645	1-130-164-11	Ⓑ 0.0012	100 V	
C646	1-130-163-11	Ⓑ 0.0011	100 V	
C647	1-130-131-11	Ⓑ 0.0016	100 V	
C648	1-109-692-11	Ⓓ 620 p	500 V	mica

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description		
C701, 751 C702 752	1-102-246-12 Ⓐ	0.047		mylar
C703 753 C704, 754	1-123-192-11 Ⓐ	47	16 V	elect
C705, 755 C706, 756	1-123-068-11 Ⓑ	220	16 V	elect
C708 758	1-123-196-11 Ⓐ	100	6.3 V	elect
C709, 759	1-121-391-11 Ⓐ	1	50 V	elect
C801, 802	1-108-421-12 Ⓑ	0.01	200 V	mylar
C803, 804	1-123-246-11 Ⓓ	3300	25 V	elect
C805, 806	1-108-421-12 Ⓑ	0.01	200 V	mylar
C807, 808	1-123-246-11 Ⓓ	3300	25	elect
C809	1-121-398-11 Ⓐ	10	25 V	elect
C810	1-121-935-11 Ⓑ	100	25 V	elect

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omited. Refer to the list on page 31 for their part numbers.

Ref. No.	Part No.			
R101, 151	1-214-173-11 Ⓐ	51 k	¼ W	metal oxide
R127, 177 R134, 184 R141, 191 R148, 198	1-214-180-11 Ⓐ	100 k	¼ W	metal oxide
R201, 251	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R202, 252	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R203, 253	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R204, 254	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R205, 255	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R206, 256	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R207, 257	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R208, 258	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R209, 259	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R210, 260	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R211, 261	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R212, 262	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R301, 351	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R302, 352	1-214-158-11 Ⓐ	12 k	¼ W	metal oxide
R303, 353	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R304, 354	1-214-158-11 Ⓐ	12 k	¼ W	metal oxide
R305, 355	1-214-160-11 Ⓐ	15 k	¼ W	metal oxide
R306, 356	1-214-165-11 Ⓐ	24 k	¼ W	metal oxide
R307, 357	1-214-153-11 Ⓐ	7.5 k	¼ W	metal oxide
R308, 358	1-214-155-11 Ⓐ	9.1 k	¼ W	metal oxide
R309, 359	1-214-160-11 Ⓐ	15 k	¼ W	metal oxide
R310, 360	1-214-162-11 Ⓐ	18 k	¼ W	metal oxide
R311, 362	1-214-165-11 Ⓐ	24 k	¼ W	metal oxide
R312, 362	1-214-169-11 Ⓐ	36 k	¼ W	metal oxide
R313, 363	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R314, 364	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R315, 365	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R316, 366	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R317, 367	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R318, 368	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R319, 369	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R320, 370	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R321, 371	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R322, 372	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R323, 373	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R324, 374	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R401, 451	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R402, 452	1-214-158-11 Ⓐ	12 k	¼ W	metal oxide
R403, 453	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R404, 454	1-214-158-11 Ⓐ	12 k	¼ W	metal oxide
R405, 455	1-214-160-11 Ⓐ	15 k	¼ W	metal oxide
R406, 456	1-214-165-11 Ⓐ	24 k	¼ W	metal oxide
R407, 457	1-214-153-11 Ⓐ	7.5 k	¼ W	metal oxide
R408, 458	1-214-155-11 Ⓐ	9.1 k	¼ W	metal oxide
R409, 459	1-214-160-11 Ⓐ	15 k	¼ W	metal oxide
R410, 460	1-214-162-11 Ⓐ	18 k	¼ W	metal oxide
R411, 461	1-214-165-11 Ⓐ	24 k	¼ W	metal oxide
R412, 462	1-214-169-11 Ⓐ	36 k	¼ W	metal oxide
R413, 463	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R414, 464	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R415, 465	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R416, 466	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R417, 467	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide
R418, 468	1-214-163-11 Ⓐ	20 k	¼ W	metal oxide
R419, 469	1-214-156-11 Ⓐ	10 k	¼ W	metal oxide
R420, 470	1-214-159-11 Ⓐ	13 k	¼ W	metal oxide

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description		
R421, 471	1-214-163-11	Ⓐ 20 k	¼ W	metal oxide
R422, 472	1-214-156-11	Ⓐ 10 k	¼ W	metal oxide
R423, 473	1-214-159-11	Ⓐ 13 k	¼ W	metal oxide
R424, 474	1-214-163-11	Ⓐ 20 k	¼ W	metal oxide
R501, 551	1-214-156-11	Ⓐ 10 k	¼ W	metal oxide
R502, 552	1-214-158-11	Ⓐ 12 k	¼ W	metal oxide
R503, 553	1-214-163-11	Ⓐ 20 k	¼ W	metal oxide
R504, 554	1-214-158-11	Ⓐ 12 k	¼ W	metal oxide
R505, 555	1-214-160-11	Ⓐ 15 k	¼ W	metal oxide
R506, 556	1-214-165-11	Ⓐ 24 k	¼ W	metal oxide
R507, 557	1-214-153-11	Ⓐ 7.5 k	¼ W	metal oxide
R508, 558	1-214-155-11	Ⓐ 9.1 k	¼ W	metal oxide
R509, 559	1-214-160-11	Ⓐ 15 k	¼ W	metal oxide
R510, 560	1-214-162-11	Ⓐ 18 k	¼ W	metal oxide
R511, 561	1-214-165-11	Ⓐ 24 k	¼ W	metal oxide
R512, 562	1-214-169-11	Ⓐ 36 k	¼ W	metal oxide
R707, 757 R708, 758	1-211-498-11	Ⓐ 10	¼ W	carbon (nonflammable)
R801	1-206-654-11	Ⓐ 390	2 W	metal oxide (nonflammable)
R810	1-244-872-11	Ⓐ 910	½ W	Carbon
RV601–604 RV651–654	1-226-216-11	Ⓕ 20 k/20 k, variable; LEFT, RIGHT ATTENUATOR		
RT101, 151 RT102, 152 RT201, 251 RT202, 252	1-224-247-XX	Ⓒ 100 Ω, adjustable; offset		

SWITCHES

S1–6	1-552-381-00	Ⓕ Rotary-Slide; CROSSOVER FREQUENCY
S7	1-514-722-XX	Ⓒ Microswitch; muting
S8	⚠1-552-294-12	Rotary; POWER (Canadian model)
S8	⚠1-552-295-12	Ⓖ Rotary; POWER (AEP model)

Ref. No.	Part No.	Description
		MISCELLANEOUS
CNJ1–12	1-561-141-00	Ⓒ Connector, circuit board
CNJ13–15	⚠1-526-528-00	Socket; AC OUTLET (Canadian model)
CNP1	⚠1-551-511-00	Cord, power (Canadian model)
CP1	⚠1-231-341-00	Ⓓ Spark killer (Canadian model)
F1	⚠1-532-078-00	Ⓑ Fuse T1A (AEP model)
J101–105 J151–155	1-507-567-00	Ⓑ Jack, 1 P; INPUT, OUTPUT
PL1	1-518-331-81	Ⓑ Lamp, 6.0 V 35 mA; power
RY1–8	1-515-314-00	Ⓔ Relay
T1	⚠1-446-143-00	Transformer, power (Canadian model)
T1	⚠1-446-142-00	Ⓠ Transformer, power (AEP model)
	⚠1-508-897-00	Ⓒ Voltage Selector (AEP model)
	⚠1-509-546-00	Ⓓ Connector, 3 p AC IN (AEP model)
	⚠1-533-131-00	Ⓐ Holder, fuse (AEP model)

ACCESSORY AND PACKING MATERIALS

Part No.	Description
A-4464-086-A	Ⓞ Unit (3) Ass'y
1-551-315-00	Ⓗ Cord, connecting; RK-112
1-551-315-21	Ⓗ Cord, connecting; RK-113
3-701-020-00	Ⓐ Bag, check sheet
3-701-622-11	Ⓐ Bag, polyethylene
3-770-360-11	Manual, instruction (AEP model)
3-770-360-21 3-794-300-31	Manual, instruction (Canadian model)
4-809-251-00	Ⓐ Bag, protection
4-852-949-00	Ⓒ Cushion
4-854-431-00	Ⓒ Box, accessory
4-854-432-00	Ⓒ Case, unit

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

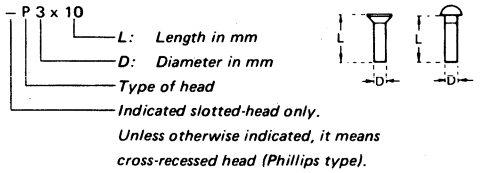
1/4 WATT CARBON RESISTORS Ⓐ

Note: Circled letter Ⓐ is applicable to European models only.

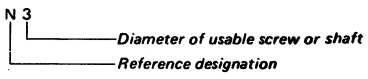
Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*	Ω	*Part No.*
1.0	1-244-601-11	10	1-244-625-11	100	1-244-649-11	1.0k	1-244-673-11	10k	1-244-697-11	100k	1-244-721-11	1.0M	1-244-745-11
1.1	1-244-602-11	11	1-244-626-11	110	1-244-650-11	1.1k	1-244-674-11	11k	1-244-698-11	110k	1-244-722-11	1.1M	1-244-746-11
1.2	1-244-603-11	12	1-244-627-11	120	1-244-651-11	1.2k	1-244-675-11	12k	1-244-699-11	120k	1-244-723-11	1.2M	1-244-747-11
1.3	1-244-604-11	13	1-244-628-11	130	1-244-652-11	1.3k	1-244-676-11	13k	1-244-700-11	130k	1-244-724-11	1.3M	1-244-748-11
1.5	1-244-605-11	15	1-244-629-11	150	1-244-653-11	1.5k	1-244-677-11	15k	1-244-701-11	150k	1-244-725-11	1.5M	1-244-749-11
1.6	1-244-606-11	16	1-244-630-11	160	1-244-654-11	1.6k	1-244-678-11	16k	1-244-702-11	160k	1-244-726-11	1.6M	1-244-750-11
1.8	1-244-607-11	18	1-244-631-11	180	1-244-655-11	1.8k	1-244-679-11	18k	1-244-703-11	180k	1-244-737-11	1.8M	1-244-751-11
2.0	1-244-608-11	20	1-244-632-11	200	1-244-656-11	2.0k	1-244-680-11	20k	1-244-704-11	200k	1-244-728-11	2.0M	1-244-752-11
2.2	1-244-609-11	22	1-244-633-11	220	1-244-657-11	2.2k	1-244-681-11	22k	1-244-705-11	220k	1-244-729-11	2.2M	1-244-753-11
2.4	1-244-610-11	24	1-244-634-11	240	1-244-658-11	2.4k	1-244-682-11	24k	1-244-706-11	240k	1-244-730-11	2.4M	1-244-754-11
2.7	1-244-611-11	27	1-244-635-11	270	1-244-659-11	2.7k	1-244-683-11	27k	1-244-707-11	270k	1-244-731-11	2.7M	1-244-755-11
3.0	1-244-612-11	30	1-244-636-11	300	1-244-660-11	3.0k	1-244-684-11	30k	1-244-708-11	300k	1-244-732-11	3.0M	1-244-756-11
3.3	1-244-613-11	33	1-244-637-11	330	1-244-661-11	3.3k	1-244-685-11	33k	1-244-709-11	330k	1-244-733-11	3.3M	1-244-757-11
3.6	1-244-614-11	36	1-244-638-11	360	1-244-662-11	3.6k	1-244-686-11	36k	1-244-710-11	360k	1-244-734-11	3.6M	1-244-758-11
3.9	1-244-615-11	39	1-244-639-11	390	1-244-663-11	3.9k	1-244-687-11	39k	1-244-711-11	390k	1-244-735-11	3.9M	1-244-759-11
4.3	1-244-616-11	43	1-244-640-11	430	1-244-664-11	4.3k	1-244-688-11	43k	1-244-712-11	430k	1-244-736-11	4.3M	1-244-760-11
4.7	1-244-617-11	47	1-244-641-11	470	1-244-665-11	4.7k	1-244-689-11	47k	1-244-713-11	470k	1-244-737-11	4.7M	1-244-761-11
5.1	1-244-618-11	51	1-244-642-11	510	1-244-666-11	5.1k	1-244-690-11	51k	1-244-714-11	510k	1-244-738-11	5.1M	1-244-762-11
5.6	1-244-619-11	56	1-244-643-11	560	1-244-667-11	5.6k	1-244-691-11	56k	1-244-715-11	560k	1-244-739-11		
6.2	1-244-620-11	62	1-244-644 11	620	1-244-668-11	6.2k	1-244-692-11	62k	1-244-716-11	620k	1-244-740-11		
6.8	1-244-621-11	68	1-244-645-11	680	1-244-669-11	6.8k	1-244-693-11	68k	1-244-717-11	680k	1-244-741-11		
7.5	1-244-622-11	75	1-244-646-11	750	1-244-670-11	7.5k	1-244-694-11	75k	1-244-718-11	750k	1-244-742-11		
8.2	1-244-623-11	82	1-244-647-11	820	1-244-671-11	8.2k	1-244-695-11	82k	1-244-719-11	820k	1-244-743-11		
9.1	1-244-624-11	91	1-244-648-11	910	1-244-672-11	9.1k	1-244-696-11	91k	1-244-720-11	910k	1-244-744-11		

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	